

SOLAR ECLIPSE NEWSLETTER

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The sole Newsletter dedicated to Solar Eclipses

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Dear SENL reader,

When we are finishing this newsletter, some of the die hards are on its way to observe the total solar eclipse of 23 November 2003. Indeed, some of the eclipse chasers left with the icebreaker from South Africa towards the Antarctic. Hopefully they will have a safe journey and we hope of course a safe return.

Many others will leave for Australia and will observe the eclipse from the air. We wish them of course all success with the observations of the eclipse. Hopefully we will see some nice images of the eclipses, and their accounts in a few weeks time.

The total lunar eclipse is another challenge for this month. At the moment it is quite cloudy in England but we hope for the best and will try to publish some pictures in the next newsletter.

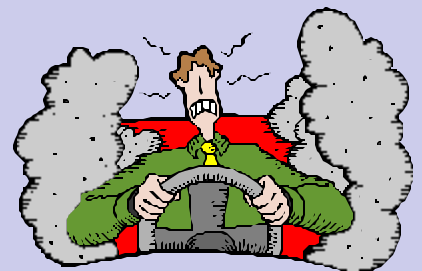
On the last page of this newsletter you will see a distribution of the gender and the age of the SEML subscribers (only 35% of the subscribers replied the questionnaire though). At the moment we have 315 SEML subscribers, out off over 40 different countries.

On top, we have about 200 extra which do receive at least one message. This last so called SEWP mailing list is run separately. But those subscribed on the SEML, do receive all SEWP messages.

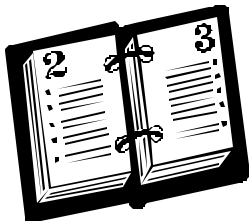
Please enjoy this newsletter. If you have comments, contributions or whatever, please drop us a message. And ... please keep those solar eclipse related messages coming ...

Cheers,

Joanne & Patrick

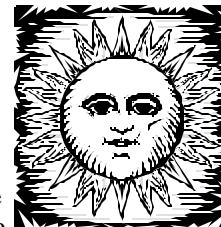


SECalendar



Dear All,

Please find herewith the solar eclipse calendar (SECalendar) for January. If you have any additional information, queries or remarks, please drop us a mail. For the whole Solar Eclipse Calendar, see our Solar Eclipse WebPages at <http://solareclipsewebpages.users.btopenworld.com>



November 2003

November 01, 2282 Three eclipses in one month. 2282 Nov 01 Partial Solar Eclipse, 2282 Nov 16 Total Lunar Eclipse, 2282 Nov 30 Partial Solar Eclipse. (Ref. SEML 06/00)

November 01, 1858 Birth of Gustav von Struve, Russian astronomer. Contributed in statistical astronomy and sun. Same family name of other family members. Died in 1920. (Ref. DD11/99)

November 01, 1905 Minor planet (1967) Menzel A905 VC. Discovered 1905 November 1 by M. Wolf at Heidelberg. Named in honor of Donald Howard Menzel (1901-1976), Harvard astronomer since 1932 and director of the Harvard College Observatory from 1954 to 1966. Both a theoretical and observational pioneering solar and stellar astrophysicist, he calculated atomic transition probabilities, chemically analysed stars and nebulae, and made fundamental contributions to our understanding of physical processes in gaseous nebulae, the solar chromosphere, and interpretation of stellar spectra. He observed 15 solar eclipses, determined spectroscopically the rotation rates of Uranus and Neptune and helped educate a number of prominent astronomers. On the lighter side he is well known for his doodling and for debunking of UFO's. (M 4158) Obituaries published in *Astronomie*, Vol. 91, p. 50 (1977); *Nature*, Vol. 267, p. 189 (1977); *Phys. Today*, Vol. 30, No. 5, p. 96, 98 (1977); *Sky Telesc.*, Vol. 53, p. 244-251 (1977). *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November 01, 1948 The Eclipse Comet only 2 degrees from the Sun and observed during totality in Nairobi, Kenya. Photographed by Robert d' Escourt Atkinson. After, the comet was observed till April 3, 1949 in the southern hemisphere.

November 01, 1982 Death of Dutch astronomer Jakob Houtgast (Assen 1908 - 1982 Utrecht). Houtgast worked on the Observatory of Utrecht, Netherlands and was specialist in the Sun and joined a lot of Solar Eclipse expeditions. (Ref. Heelal 12/82)

November 01, 1994 Launch of Wind (US). Research of Solarwind, together with Polar and Fast. (ref. DD 10/98)

November 02, 1875 Minor Planet (153) Hilda Discovered 1875 November 2 by J. Palisa at Pola. Named in honor of (probably the eldest) daughter of the Austrian astronomer Theodor von Oppolzer (1841-1886) {see planet (1492)}. She died some years prior to her father. (*Vierteljahrsschr. Astron. Ges.*, 22. Jahrg., p. 191 (1887)) Named by Th. von Oppolzer. *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg.

November 02, 1906 Birth of Bengt Edlen in Gusum in Ostgotland, south eastern Sweden. Ref. *The Bibliographical Dictionary of Scientists*, edited by David Abbott, 1994.

November 03, 1994 Total solar eclipse observed with success by most observers in Chili and Bolivia.

November 03, 2013 Annular-total solar eclipse which will be annular in the beginning and total for the rest of the path. Between 1898 and 2510, there are only a few cases: 3 November 2013, 17 October 2172 and 29 April 2386. Ref. *Canon of Solar Eclipses, 1898-2510* by Meeus, Grosjean and Vanderleen (p. 76).

November 03, 2013 Long eclipseless period of 12.86 years for Boston and Providence between solar eclipse of 25 December 2000 and 3 November 2013. Ref. *More Mathematical Astronomical Morsels* by Jean Meeus; Willmann-Bell, 2002.

November 04, 1920 Gustav von Struve, Russian astronomer died. Contributed in statistical astronomy and sun. Same family name of other family members. Born in 1858.

(Continued on page 3)

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November 04, 1983 Minor Planet (3841) Diccico 1983 VG7. Discovered 1983 November 4 by B. A. Skiff at Anderson Mesa. Named in honor of Dennis di Cicco, since 1974 a staff member and since 1983 an associate editor of *Sky and Telescope*. An imaginative and outstanding astrophotographer, he has participated in many expeditions, specifically to observe eclipses and comets, although his best-known work is probably the analemma showing the Sun from the same spot at the same mean time every few days throughout the year. Particularly meticulous and appropriately cautions in all his writings, he regularly conducts the 'Observers Page' column in the magazine. (M 16246) Citation prepared by B. G. Marsden at the request of the discoverer. *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November 04, 1988 Minor Planet (5869) Tanith 1988 VN4. Discovered 1988 November 4 by C. S. Shoemaker and E. M. Shoemaker at Palomar. Seen as a heavenly goddess by the conquering Romans who called her *Caelestis*, Tanith was worshipped by the Carthaginians. This winged sky-goddess of the Punic people wore a zodiac around her head and held the sun and moon in either hand. (M 24918) *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November 05, 1846 March 16, 1914 Edward Singleton Holden (known pseudonyms Edward Atherton, Adam Singleton), assistant to Simon Newcomb (1835-1909), wrote various pieces about solar eclipses. Born in St. Louis, Missouri on November 5, 1846 and passed away in West Point, NY on 16 March 1914. He was a cousin of G.P. Bond. Ref. *Bibliography of Astronomers* by Paul Luther, 1989.

November 05, 1983 Minor Planet (3744) Horn-d'Arturo 1983 VE. Discovered 1983 November 5 at the Osservatorio San Vittore at Bologna. Named in memory of Guido Horn-d'Arturo (1879-1967), director of the Bologna Observatory for almost half a century and a talented astronomer far ahead of his time. A pioneer in the design and construction of multiple-mirror telescopes, he designed and utilized the world's first such instrument, a 1.80-m zenith telescope at Bologna. In the 1920s he correctly interpreted the shadow-band phenomenon and attributed an important component of stellar scintillation to currents in the Earth's stratosphere. Following a suggestion by Luigi Jacchia {see planet (2079)}, he founded the magazine *Coelum* in 1931. (M 13178) *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November 07, 1631 Pierre Gassendi, Wilhelm Schickard, Johannes Hevelius and Johannes Kepler observed for the first time a Transit of Mercury. The two late also predicted the event. Martin van den Hove wrote a book about it. (Ref. DD11/99)

November 07, 1953 Minor planet (1764) Cogshall 1953 VM1. Discovered 1953 November 7 at the Goethe Link Observatory at Brooklyn, Indiana. Named in honor of W. A. Cogshall, professor of astronomy at Indiana University (1900-44). He was known for his work on visual binary stars, photography of solar eclipses, and as a teacher of many who followed professional careers in astronomy. (M 3143) Proposed by F. K. Edmondson. *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November 08, 1656 Edmond Halley (1656-1742 or 1743) born on November 08, 1656 in Haggerton near London. Famous for his comet but also for his first observations on Baily's beads. The Royal Society also mentioned 29 October 1656. (Ref. Rc1999). Due to the Julian-Gregorian calendar change, the 8th of November 1656 in France was the 29th of October 1656 in England. (Ref. Michel Andre Levy 10/00). Died in Greenwich 14 January 1742. Ref. *The Bibliographical Dictionary of Scientists*, edited by David Abbott, 1994.

November 09, 1853 Carrington Rotation number 1 starts and initiated by R.C. Carrington.

November 11, 0923 "(This) solar eclipse was calculated and observed by Abu al-Hassan Ali ibn Amajur, who used the al-Zij al-Arabi of Habash . . . We as a group observed and clearly distinguished it . . . We observed this eclipse at several sites on the Tarmah (an elevated platform on the outside of the building) . . . According to calculation from the conjunction tables in the habash Zij the middle was at 0;31 h (i.e. 31 min) and its clearance at 0;44 hours (i.e. 44 min), calculation being in advance of observation." Refers to a solar eclipse of 11 November AD 923. From: Ibn Yunus. Quoted in *Historical Eclipses and Earth's Rotation*, by F Richard Stephenson, Cambridge University Press, 1997, page 459.

November 11, 1969 Minor planet (2385) Mustel 1969 VW. Discovered 1969 November 11 by L. I. Chernykh at Nauchnyj. Named

(Continued on page 4)

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in honor of Evald Rudolfovich Mustel' {1911-1988}, chairman of the Astronomical Council of the U.S.S.R. Academy of Sciences, editor of the *Astronomicheskij Zhurnal*, and a vice-president of the IAU during 1970-1976. His research activities involve several aspects of solar and stellar physics and the correlation of geophysical phenomena and solar activity. (M 7617) Obituaries published in *Astron. Zh.*, Tom 65, Vyp. 4, p. 891-892 (1988); *Pis'ma Astron. Zh.*, Tom 14, No. 8, p. 764 (1988); *Zemlya Vseleennaya*, No. 5, p. 42-45 (1988); *Astrophys. Space Sci.*, Vol. 155, No. 1, p. 1 (1989); *Sov. Astron. Lett.*, Vol. 14, No. 4, p. 326 (1988); *Sov. Astron.*, Vol. 32, No. 4, p. 466-467 (1988). *Dictionary of Minor Planet Names* - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November 12, 1547 Extremely wide path of the annular eclipse of 12 November 1547. The path is 1400 kilometers wide. The northern limit is only a small circle between Normay and Iceland. The paths covers nearly whole Great Britain. (Ref. St L 06/99)

November 12, 1891 Birth of Seth B. Nicholson, American Astronomer. His main task was observing the sun. He published yearly, and for decades, reports about sunspots and magnetic fields. He died in 1963. (Ref. DD11/99)

November 12, 1966 On November 12th 1966 total solar eclipse, Gemini 12 astronauts Lovell and Aldrin saw the eclipse from orbit and they saw the moon shadow on earth surface. For them totality lasted only 6 sec. Lift-off of Titan booster have been synchronized in order to intercept that total eclipse that was visible from south America. (Ref. PA07/98)

November 12, 1985 Total solar eclipse on the Antarctic and of which the northern limit was more to the south then the southern limit of the eclipse.

November 14, 1659 In Chapter VII of "A Handbook of Solar Eclipses" by Isabel M. Lewis which was written in advance of the 1925 eclipse over NE USA, Lewis identifies the eclipses of November 14, 1659, August 22, 1672, July 12, 1684 (AT), and January 19, 1768 (AT) as having occurred in the years that elapsed since the Pelgrim fathers landed in New England. (Ref. ENB012)

November 17, 1183 ". . . the Minamoto army fled, frightened by a solar eclipse." Refers to an annular eclipse of 17 November 1183. From: *Gehpei seiseiki* (Japanese history of the Minamoto and Taira clans). Quoted in *Historical Eclipses and Earth's Rotation*, by F Richard Stephenson, Cambridge University Press, 1997, page 266.

November 20, -0128 (129 BC) "Hipparchus tries to demonstrate the Moon's distance by guessing at the Sun's. First he supposes that the Sun has the least perceptible parallax, in order to find its distance, and then he uses the solar eclipse which he adduces; at one time he assumed that the Sun has no perceptible parallax, at another that it has a parallax big enough [to be observed]. As a result, the ratio of the Moon's distance came out different for him for each of the hypotheses he put forward; for it is altogether uncertain in the case of the Sun, not only how great its parallax is, but even whether it has any parallax at all." From: Ptolemy, *Almagest*, V, 11. "So Hipparchus, being uncertain concerning the Sun, not only how great a parallax it has but whether it has any parallax at all, assumed in his first book of 'On Sizes and Distances' that the Earth has the ratio of a point and centre to the Sun [i.e. the Sun's sphere]. And at one time using the eclipse he adduced, he assumed that it had the least parallax, and at another time a greater parallax. Hence the ratios of the Moon's distances came out different. For in Book 1 of 'On Sizes and Distances' he takes the following observation: an eclipse of the Sun, which in the Hellespontine region was an exact eclipse of the whole Sun, such that no part of it was visible, but at Alexandria in Egypt approximately four-fifths of the diameter was eclipsed. By means of the above he shows in Book 1 that, in units of which the radius of the Earth is one, the least distance of the Moon is 71, and the greatest 83. Hence the mean is 77. . . Then again he himself in Book 2 of 'On Sizes and Distances' shows from many considerations that, in units of which the radius of the Earth is one, the least distance of the Moon is 62, the mean 67-1/3 and the Sun's distance 490. It is clear that the greatest distance of the Moon will be 72-2/3." From: Pappus, *Commentary on the Almagest* "Moreover, such an observation has been made in the case of an eclipse of the Sun. Once the Sun was wholly eclipsed in the Hellespont, it was observed in Alexandria to be eclipsed except for the firth part of its diameter, which is, according to the sight, except for two digits and a little more. . . Now since it is 5000 stades from Alexandria to Rhodes; besides, proceeding hence to the Hellespont, this will also decrease in proportion, since when the Hellespont is reached, it will entirely vanish." From: Cleomedes, *De Motu Circularis Corporum*, II, 3. These three quotations probably refer to a total solar eclipse of 20 November 129 BC. Quoted in *Historical Eclipses and Earth's Rotation*, by F Richard Stephenson, Cambridge University Press, 1997, page 351.

November 22, 1972 Launch of ESRO 4 (ESA), studied atmosphere and solarwind. (Ref. DD11/99)

November 22, 1944 Arthur Stanley Eddington died in Cambridge. Ref. *The Bibliographical Dictionary of Scientists*, edited by

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David Abbott, 1994.

November 22, 1984 Total solar eclipse in a part of New Guinea and only 18 lunations (1 ½ year) after the total solar eclipse of 11 June 1983 which was also visible from that part. One Saros later on 21 June 2001 and 4 December 2002 a small part of Angola will witness a total solar eclipse. (Ref. JM09/99)

November 23, 2003 The total solar eclipses of 9 March 1997 and 26 February 1998 were less than 365 days apart. This was the last time two TSE happened in less than a year's time. The next occurrence is the two total solar eclipses of 4 December 2002 and 23 November 2003. After that we have the duo TSE year of 1 August 2008 and 22 July 2009, and 22 July 2009 and 11 July 2010. Ref. More Mathematical Astronomical Morsels by Jean Meeus; Willmann-Bell, 2002. Patrick Poitevin observed following similar duo's: 1990-1991, 1991-1992, 1994-1995, 1997-1998. He will miss the duo 2002-2003 because of the missing Antarctic eclipse, which will be far too expensive. The next total solar eclipse in the Antarctic after 23 November 2003 is 4 December 2021 and 15 December 2039 (the last was 12 November 1985). Ref. More Mathematical Astronomical Morsels by Jean Meeus; Willmann-Bell, 2002.

November 24, 0029 "And Phlegon also who compiled the Olympiads writes about the same things in his 13th book in the following words: 'In the fourth year of the 202nd Olympiad (AD 32-33), an eclipse of the Sun took place greater than any previously known, and night came on at the sixth hour of the day, so that stars actually appeared in the sky; and a great earthquake took place in Bithynia and overthrew the greater part of Niceaea.'" Possibly refers to a total solar eclipse of 24 November AD 29, the reference to AD32-33 being incorrect. From: Phlegon, Olympiades, fragment 17. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, page 359.

November 24, 0029 "I will show portents in the sky and on earth, blood and fire and columns of smoke; the sun shall be turned into darkness and the moon into blood before the great and terrible day of the Lord comes." Joel, Chapter 2, verses 30, 31 (Old Testament). "And I will show portents in the sky above, and signs on the earth below - blood and fire and drifting smoke. The Sun shall be turned to darkness, and the moon to blood, before that great, resplendent day, the day of the Lord, shall come." Peter in Acts of the Apostles This reference to a blood-red Moon, and the following references in the Gospels to a darkening sky, have been interpreted as placing the date of the crucifixion to 24 November AD 29, when there was an eclipse of the Sun, or Friday, 3 April AD 33, when there was a partial eclipse of the Moon over Jerusalem. Ref FE 01/01

November 24, 1989 Solar Maximum Mission (SMM - US) stopped. Performed 9 years observations of the sun. In 1984 in de shuttle repaired. (ref. DD11/99)

November 25, 1995 The first DDD (De Duistere Dag or The Dark Day), organized by the Solar Eclipse Section (Patrick Poitevin), VVS Belgium in Volkssterrenwacht Mira in Grimbergen, Belgium. Speakers were Jean Meeus (triangles and eclipses), Felix Verbelen and Anton Vollemaere (Codex: Eclipses and Maya's) and Patrick Poitevin (Eclipse November 03, 1995).

November 28, 1883 Minor Planet (235) Carolina Discovered 1883 November 28 by J. Palisa at Vienna. Named for an atoll of the Line Islands, 450 miles northwest of Papeete, Tahiti, where the discoverer observed the solar eclipse of May 6, 1883. Palisa observed the solar neighborhood in order to find an intra-Mercurian planet. (H 28) Named by the discoverer (BAJ Circ., No. 218 (1883)) in remembrance of his voyage to this island. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

November, 1996 First issue of the Eclips Nieuwsbrief (Eclipse Newsletter). Monthly magazine of the Solar Eclipse Section, VVS Belgium. Editor and founder Patrick Poitevin. Patrick continued the SENL (Solar Eclipse Newsletter) after leaving the Solar Eclipse Section and edited the SENL with partner Joanne Edmonds. The SENL issues can be downloaded (free of charge) from the webpages of Fred Espenak.

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

Best regards, Patrick and Joanne

solareclipsewebpages@bopenworld.com
<http://solareclipsewebpages.users.bopenworld.com>



SETalk

Artis planetarium

From: Michel Hommel To: solareclipsewebpagesSENL200311bopenworld.com Date: Fri, 03 Oct 2003 10:14:54

Hi Patrick, Here at the Artis Planetarium we are preparing a new show on Islamic astronomy. We intend to show a real total eclipse with our video beams - unfortunately the clip we intended to use is unsuitable.

The premiere of our show is next thursday and we are in desperate need of a good clip of a total eclipse, including diamond ring, from beginning to end. Both Govert Schilling and Johan Gijsenbergs told us that you might be able to help us.

So, do you have a hi-res clip of a real total eclipse, and may we use it and if so, how can we get it here in time for the premiere (by courier or if necessary we will drive over by car)?

Could you please call me asap: Thank you, Michel Hommel Artis Planetarium - Amsterdam tel. 020 - 5233426 / 06 - 53290861 Michel Hommel <m.hommelSENL200311artis.nl>

CNN tonight

From: Jay.M.PasachoffSENL200311williams.edu To: solareclipsesSENL200311aula.com Date: Sun, 05 Oct 2003 13:40:38

The Americans and Canadians on this list who are going to Antarctica may want to watch a CNN show tonight at 8 pm Eastern Daylight Time on what it is like to travel in Antarctica. The advance clips looked interesting.

Antiquity of 'Dragon's Head and Tail'

From: JpvdGiessen To: SOLARECLIPSESENL200311AULA.COM Cc: pnSENL200311egma.sonnet.co.uk Date: Sun, 05 Oct 2003 20:42:50

In February 1999 Peter Nockolds wrote the following about the antiquity of the dragon's head and tail: "I take Joe Tenn's hint. However mentioning the Bible prompts me to raise a question about the antiquity of the terms 'Dragon's Head and Tail'. According to a medieval Latin word list these have been traced back in Latin to the 11th century CE and, as I remember, Bradley Allen in 'Star Names, their Lore and Meaning' does not take them back much further.

C W Maunder in 'The Astronomy of the Bible' 1909 suggests they go back much further, to Mesopotamian Culture, linking them with the Biblical Leviathan and noting the occurrence of the symbol for the nodes in various Mesopotamian inscriptions, but I'm not sure if anyone takes much notice of him. However Black and Green in 'Gods, Demons and Symbols of Ancient Mesopotamia' (British Museum Press 1998) give an account of a cylinder seal of Middle Assyrian date from Samsat on the Upper Euphrates. A god is receiving worship, he is identified as Sin, the Moon God, because he holds a crescent in one hand - in the other he holds the omega symbol, ie the symbol for the Moon's nodes, suggesting, at the least, that this symbol (with its dragon associations) was used for the nodes in Mesopotamia BCE. Do any other list subscribers have any info or views on the antiquity of these terms? Peter Nockolds"

I found in the Pictorial Encyclopedia of the Bible (Vol. 3 p612) the following: "Let those curse it who curse the day, who are skilled to rouse up Leviathan" (Job 3:8) Job calls for the enchanters to curse his day. This is usually taken as the rousing of the sea monster who according to primitive nations was supposed to swallow the sun or moon and bring about an eclipse. This would fit the context, ... verse 5b seems to be a reference to the eclipse."

I also found something about this subject on: <http://www.creationdays.dk/biblestudy/Universe-astronomy.html>

Do any of you have more info about this subject? Jan Pieter van de Giessen



SETalk

New Sony videocamera with 3 Megapixel CCD

From: Klipsi To: SOLARECLIPSESEN200311AULA.COM Date: Sun, 05 Oct 2003 20:45:56

shopping for a new camera for your next eclipse ? Sony recently brought the 60 and 80 models, with 2 megapixel CCD. But now for better news : I just learned that Sony brings a new miniDV video camera, the PC330 (probably to replace the PC120), and it comes with a 3 megapixel CCD, (not 3 onemegapixels) which allows quite hi-res photos, too. Carl Zeiss lens zoom equivalent 45-450mm. Sony also brings a digital photo camera with 8 megapixel CCD, but that one is no video cam. If I were to buy a digital photo camera only, I would rather go for Canon SLR models, to use all the lenses I have, such as the new D300 with 6 megapixels . But as a vid-eocamera the Sony PC330 with 3 megapixels (!), now that is really interesting, cause you get an excellent videocamera and a pretty good photo camera with x10 zoom lens, all in one compact box. hm..... Klipsi

From: Robert B Slobins

Klipsi et al: The Canon SLR line will NOT allow the use of lenses with the previous Canon mounts, only those with the electronic focusing (EF) mount. This means that superb optics like the Tamron and Canon L lenses in the FC mounts have to be discarded for digital.

You want to investigate the Nikon-compatible SLR's which includes not only Nikon, but also Fuji and Kodak, IIRC. The Nikon AI lenses can be used at the sacrifice of all of the digital features the Nikon auto-focus lenses can provide with the body. The drawback with film lenses on digital is that there is a fall-off of image quality that may not be distinguishable on film. The lenses for digital SLR's are formulated to ensure flat focus across the CCD. This, I understand, is a real problem with wide-angle lenses.

However, in this particular line of work, who really cares about that, as long as one uses telephoto lenses?

Incidentally, because of the smaller area of the CCD chip compared with the 35mm film format, one sees statements that a 50mm lens is like a 70mm and so forth. Do understand that although a 400mm lens fills the field of the CCD chip as if it were a 600 mm lens, the image is still the same scale and size! In other words, the moon still covers 3.7mm with a 400mm lens, no matter what the size of the chip or film. cheers/rbs

shopping for a new camera for your next eclipse ? Sony recently brought the 60 and 80 models, with 2 megapixel CCD. But now for better news : I just learned that Sony brings a new miniDV video camera, the PC330 (probably to replace the PC120), and it comes with a 3 megapixel CCD, (not 3 onemegapixels) which allows quite hi-res photos, too. Carl Zeiss lens zoom equivalent 45-450mm. Sony also brings a digital photo camera with 8 megapixel CCD, but that one is no video cam. If I were to buy a digital photo camera only, I would rather go for Canon SLR models, to use all the lenses I have, such as the new D300 with 6 megapixels . But as a vid-eocamera the Sony PC330 with 3 megapixels (!), now that is really interesting, cause you get an excellent videocamera and a pretty good photo camera with x10 zoom lens, all in one compact box. hm..... Klipsi

From: Klipsi

correction :

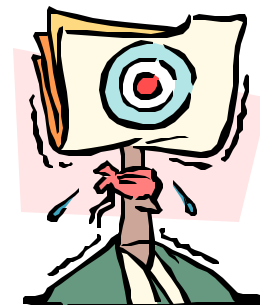
45-450mm is in videomode. but in digital photo mode the lens works like a 37-370mm zoom.

details in german http://www.sony.ch/view.x?prod=1008581&loc=de_CH Klipsi

From: Gerard M Foley

I don't think this is altogether true. I understand that the D300 will accept the same lenses as the film Rebel, but that there are lenses made specially for the smaller sensor area which will not work in Canon film SLR's. To be sure about this, consult

<http://www.dpreview.com/>



(Continued on page 8)

SETalk

the review sections of which I find highly reliable with respect to digital still cameras. The forums are on their own. Gerry

From: Evan Zucker

That's absolutely correct. All Canon EOS lenses work on the new EOS 300D, but the new EF-S lens only works on the 300D. Here's what it says at dpreview.com:

In addition to this the EOS 300D is the first Canon digital SLR to support a new lens called the EF-S (S = short back focus), this has the same mount and electrical contacts as an EF lens but has a rear element which fits further into the camera allowing it to be closer to the image sensor. The lens elements can also be reduced in size as the imaging circle does not need to be as large, thus EF-S lenses should be smaller and lighter than their 35 mm equivalents. Note that EF-S lenses can only be used on the EOS 300D (so far) as no other EOS camera supports the EF-S mount. -- EVAN

Total irradiance graph

From: Jay.M.Pasachoff@SENL200311williams.edu To: solareclipses@SENL200311aula.com Date: Tue, 07 Oct 2003 14:11:17

Does anybody have, or have a reference to, the total irradiance coming from the sun measured over the several hours of partial and total eclipse? A scientist doing some terrestrial-atmosphere research has asked NOAA me for it and they referred the request to me.

Please reply to jay.m.pasachoff@SENL200311williams.edu if the reply is in plain text or to eclipse@SENL200311williams.edu if the reply is or includes an attachment. Thanks.

From: Glenn Schneider

Jay, There was a paper presented at the 2000 COSPAR meeting by Zerefos et al: "CHANGES IN SURFACE UV SOLAR IRRADIANCE AND TOTAL OZONE OVER EUROPE, DURING THE ECLIPSE OF AUGUST 11, 1999"

The abstract is on-line at: <http://216.239.57.104/search?q=cache:0BV5ucn3zNMJ:www.copernicus.org/COSPAR/warsaw2000/programme/abstracts/bbc1376.pdf+solar+irradiance+during+solar+eclipse&hl=en&ie=UTF-8>

www.copernicus.org/COSPAR/warsaw2000/programme/abstracts/bbc1376.pdf this appears in *Geophys. Res.*, 2000, 105, D2, p.26363

There was a paper: "Changes in solar irradiance and atmospheric turbidity in Costa Rica during the total solar eclipse of July, 1991 by W. Fernandez et al. in the Proceedings of the second United Nations/European Space Agency Workshop, Bogota, Colombia, 9-13 November, 1992 This was published in *Earth, Moon, and Planets*, Volume 63, #2, 1993.

I do not know if this will help. When you (he) asks for "total" irradiance, is that bolometric (i.e., over what wavelengths)?

If the interested in the UV irradiance, also, it is *possible* that some data may be forthcoming from the UARS mission's Solar Ultraviolet Irradiance Monitor (SUSIM; 115-410nm). Dr. John cook is the SUSIM PI at the Naval Research Center. UARS has been in continuous operation since 1991, and is in a 57 degree, 375 mile orbit. This is a synoptic program designed to measure absolute irradiance from solar UV through a full solar cycle. It is *possible* that data may have been taken through times of eclipse (I note the question was asked for partial eclipse so, for that, this may be likely, if the spacecraft was in the right position along its orbit. See:

"A High Precision Solar Ultraviolet Spectral Irradiance Monitor for the Wavelength Region 120-400 nm," M.E. VanHoosier, J.-D.F. Bartoe, G.E. Brueckner, D.K. Prinz and J.W. Cook, *Solar Phys.* 74, 521 (1981).

"SUSIM'S 11-Year Observational Record of the Solar UV Irradiance", L.E. Floyd, J.W. Cook, L.C. Herring, and P.C. Crane, *Adv. Space Res.*, 31, 2111-2120, 2003.

"11 Years of Solar UV Irradiance Measurements from UARS", Linton Floyd, Gary Rottman, Matthew DeLand, and Judit Pap, Pro-

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ceedings of the ISCS 2003 Symposium, submitted, 2003.

None of those are about data during eclipses, but describe the data sets . With some digging, such data may (or may not) be found to exist.

May not pan out, but worth checking.

Also, from 1894 - 1994 the ERBE experiment on ERBS measured orbit-average, but ALSO instantaneous (32s integrations) solar irradiance. These data were relatively sparse though, I think only twice a month, but also may be worth checking (you never know...) Cheers, -GS-

Eclipse retrocalculations

From: Klipsi To: SOLARECLIPSESEN200311AULA.COM Date: Tue, 07 Oct 2003 21:49:00

Howdy, any comments on this message I received ? Klipsi

> Hi Klipsi, This is from an old Skeptic friend of mine. Would you please advise how I would go about it? Regards, Col.

Subject: eclipse retrocalculations

Do you have the resources or skills to retrocalculate eclipses for specific places?

There was supposed to be an eclipse close to the destruction of Ugarit. Now according to my Readers Digest World Atlas Ugarit is at or about Longitude 36 by Latitude 36 on the north east corner of the Mediterranean Sea.

The eclipse occurred at or about Sundown, say 6 pm.

Mars was close to setting at the time of the eclipse, "close by" is the terminology. Could we say 5 - 5-30 pm for calculations.

I have two articles that I wish to check on and each has a different date for this activity although both writers used the same astronomer.

Whilst I disagree with their dates anyway it would be nice to check the calcs for around 1100 BC.

And for my specific information would you look to see if there was a suitable eclipse between 500 BC and 600 BC. Thanks in anticipation.

From: brian seales

Hi All, According to Emapwin and Wineclipse there was a total solar eclipse visible from Ugarit at sunset or just before it on 28th May 584 BC. Nothing around 1100BC though. Brian Seales www.ecliptomaniacs.com

From: barr deryl

The Eclipse Complete data base lists no less than 33 eclipses observable from 36 N & 36 E with a magnitude of .700 or greater for the period from -1200 to -1000. Of these 33, 13 were of a magnitude of .900 or greater. That of -1011 was total. This is based on a program set value for Delta T, which for the -1102 .960 magnitude eclipse is 24831 seconds, a value that agrees in general with many but not all authorities for this time period.



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Saros 139/144 and 129/134

From Nico (Gouda, The Netherlands):

"Hallo everyone, did you know that it is possible that can occur FOUR, or perhaps more, solar-eclipses IN A ROW with the points "P2" and "P3" BOTH at the morning-side of the visible-area of a solar-eclipse, or that these points are BOTH at the evening-side of the visible-area of a solar-eclipse. This occurs at BOTH solar-eclipses in 2005 and ALSO at BOTH solar-eclipses in 2006. But this occurred NOT a saros earlier in 1987/1988, and will perhaps NOT occur a saros later in 2023/2024 because the eclipse of April 8th, 2024 is JUST on the edge at "P3" at the morning or evening-side, near the North-pole. And another saros later both of the solar-eclipses of the year 2042 are both "normal" elipses, this means that the point "P2" lies at the morning-side of the visible-aera, ant the point "P3" lies at the evening-side of that area. The saros numbers are: number 129, followed by number 134, next number 139, and at the end number 144. Does somebody of you know if it possible that there are FIVE, or even more, solar-eclipses IN A ROW with that kind of visible area, with the points "P2" and "P3" at ONE side of the visible-area?"

From: Jean Meeus

The eclipse type described by Nico is was I call eclipses of Type IV on pages 68-73 of my first Morsels book ('Mathematical Astronomy Morsels', Willmann-Bell, 1997).

At such eclipses, the entire lunar penumbra passes over the Earth, but hardly so. The northern (or southern) edge of the penumbra reaches *and* leaves the Earth on the same side of the central meridian. The points 'begin or end of the eclipse on the horizon' form two separate curves, but one of these curves has the shape of a (distorted) '8'.

Nico is right about the eclipses of 2005 and 2006, but that was already mentioned on page 72 of said book: "It's remarkable that four *consecutive* solar eclipses, those of the years 2005 and 2006, are all of type IV.'

During the period AD 1950 to 2030, there are 17 eclipses of type IV. The last one was that of 1992 April 4.

I didn't investigate the solar eclipses outside the period 1950-2030, but I doubt that five successive solar eclipses of type IV are possible. Jean Meeus

From: Jean Meeus

As mentioned in my previous mail, what I call eclipses of Type IV are solar eclipses at which the points 'begin or end of the eclipse on the horizon' form two separate curves on the Earth's surface, one of them having the shape of a distorted figure '8'.

Such eclipses are not rare; there are 17 of them between the years 1950 and 2030. But what is rare is that *four* successive eclipses are of that type. As mentioned on page 72 of my first 'Morsels' book, and as Nico has pointed out recently on this List, all four solar eclipses of 2005 and 2006 will be of Type IV.

I have made some calculations, and I found that four successive solar eclipses, all of Type IV, is indeed very rare. I found only four cases between the years -200 and +3400. The last one occurred in 1466-1467, and the next one after 2005-2006 will take place in 2620-2621.

And *five* successive eclipses cannot all be of Type IV, at least during the period of 36 centuries that I investigated. Jean Meeus



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Question about eclipse seasons

From: barr derryl To: SOLARECLIPSESEN200311@aula.com Date: Sun, 12 Oct 2003 04:50:25

Dear List Members: Both Zirker's "Total Eclipses of the Sun" and Littmann, Willcox & Espenak's "Totality" do excellent jobs of defining the eclipse season and the eastern and western ecliptic limit. Additionally, such astronomical annuals as Otwell's "Astronomical Calendar" identify the precise middle of such current events. However, I have yet to uncover a periodical or website that identifies the beginning and ending dates and times for the eclipse seasons for past or future eclipse events -- the moment when the sun enters and exits what Littmann, Willcox and Espenak refer to as the "danger zone." To satisfy my own curiosity, I am investigating the correlation between gamma and the location of the eclipse event within the total ecliptic limit. But without the beginning and ending dates for specific eclipse seasons, this, of course, is impossible. Any help or suggestions for additional resources would be greatly appreciated. Thanks in advance, Derryl Barr

Virus

Subject: Re: [SEML] [SE] SEDates From: Fraser Farrell To: Patrick Poitevin <patrick_poitevin@SEN200311@iname.com> Cc: solareclipses@SEN200311@aula.com Date: Sat, 11 Oct 2003 11:44:38

Patrick, This message, apparently from you, contains a Windows virus (pretending to be a MIDI music file). cheers, Fraser Farrell

From: solareclipsewebpages@SEN200311@btopenworld.com

Dear Fraser (and others), The virus has NOT been sent by the SEML or my address. The address you copied is not even my address. It is a kind of worm which can be sent and received by anybody. NO virus' can be sent to the SEML or can pass the SEML at all, NONE!!! We do have a check up more than once a day and we are for 99.9999% secure. Trust me.

It is those kinds of worms which does send a message to all in the address book. Believe me, you are not even in my personal address book.

To ALL: Please stop sending virus message to the entire SEML. Please read your SEML rules, which you all agreed. NO, I repeat, NONE, virus can pass the SEML. It is safe and you have to trust the SEML Owner on this. Best regards, Patrick

Nasa Eclipse Site CD

From: Harvey Wasserman To: SOLARECLIPSESEN200311@AULA.COM Date: Tue, 14 Oct 2003 20:00:10

A while back, somebody was asking about Fred's Espenak's Nasa site being available on CD, or perhaps the question had to do with certain pages of the site. Fred has given me permission to copy the site and to offer it to anybody that wants it. Prices are \$15 US inside the US, and \$20 US outside. Special needs will be considered. Up to date as of Oct 13, 2003. Contact me offline at eclips-me@SEN200311@bellsouth.net Harvey Wasserman



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Fast question.....

From: KidinvsSENL200311aol.com To: SOLARECLIPSESENL200311aula.com Date: Tue, 14 Oct 2003 01:09:11

The end of the day comes at around 11:59:00....PM

If it were Monday, 11:59:00, is the last second of the day on Monday 11:59:59, or is it at 12:00:00... or is the strike of 12:00:00 Tuesday, or does it start at 12:01:01. If that were true, that means that the strike of 12:00:01 means the day is 1 second old? Rick Brown EclipseSafaris

From: Gerard M Foley

For my money, anything that starts with 12 is the next day (really I mean 00). Gerry

From: Evan Zucker

At 05:09 PM 10/13/2003, Rick wrote: I think it's a matter of semantics. If you call it 24:00:00 then it's the end of the last second of Monday; if you call it 00:00:00 then it's the beginning of the first second of Tuesday.

To avoid any possibly confusion, I always refer to the beginning of a day as 12:01 AM and the end of the day as 11:59 PM.

Similarly, 12:00 AM or 12:00 PM are inherently ambiguous and probably have no legal meaning (on a parking sign, for example). You should either refer to "12:00 midnight" or "12:00 noon." -- EVAN

From: Jay Friedland

It gets even worse when you add in technology bugs! Make sure your GPS receivers are aware...and hope we aren't using them. - Jay

From: Mike Murphy

Surely, as astronomers, we should use the international convention of the 24 hour clock and say what time measuring system we refer to. So 2359 UTC is one minute before 0000 hours UTC and if one says UTC (or whichever) then we know what it means. - Mike to whom time is a social construct anyway :-)

From: George Madden

I see time as neither a social construct -- (unless Mike is referring to alcohol haze :) -- nor a matter of semantics. I see it as an effect of gravity.

But any way one looks at it, a uniform standard for describing a time seems to me to be of paramount importance. For example, if Fred's next set of predictions for the moment of maximum eclipse is 00:00 UTC, both the 23:59:59'ers and the 00:00:01'ers would miss it. There is only one 00:00:00UTC.

For the purposes of readers of this list, I don't think it matters too much whether Tuesday begins on 00:00:00 or 00:00:01. For the general public, it could mean the difference of a full day.

My practice has been to note the passing of an "old day" and the beginning of a "new day" at the same instant: 00:00:00.000000000 (and so on). George Madden Rochester New York



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"Our Mr. Sun"

From: Jay.M.PasachoffSENL200311williams.edu To: solareclipsesSENL200311aula.com Date: Wed, 08 Oct 2003 17:01:12

The newspaper reports that there are new DVD's just released of "Our Mr. Sun," a Frank Capra movie from the 1950's based on Donald Menzel's book "Our Sun." It was a fun movie then--very low level but still worth seeing, with solar limb movies as of that time. "The Strange Case of the Cosmic Rays" is on the disk, and "Hemo the Magnificent" is on a parallel disk.

I ordered it just now from Amazon.com, where I got the two DVD's for \$25 and change with no shipping charge. (I sign in through the amazon.com box for my new Complete Idiot's Guide to the Sun at www.solarcorona.net/sun) Jay Pasachoff

From: Dale Ireland

Jay You will have plenty of "qualified" customers after this week. First, NASA misidentified a photo of the Sun lighting a contrail and called it the "fireball" of a reentering meteor. <http://antwrp.gsfc.nasa.gov/apod/ap031001.html> and to make the story worse, Paul Harvey in his nationally syndicated radio news commentary told the whole country that it was a spectacular image of...

"The death of a star, a star burning up in our Earth's atmosphere"

I heard it while driving to lunch and couldn't believe my ears. Seems there is more disinformation than truth lately. Dale

From: Jay.M.PasachoffSENL200311williams.edu

I just got my DVD of "Our Mr. Sun," the Frank Capra educational movie from 1956 based on Donald Menzel's book "Our Sun." The movie runs about 52 minutes. It includes an eclipse movie, starting with a diamond ring, interspersing views of eclipse watchers around the world, and ending the approximately 2-min segment with the final diamond ring. A little later, they show some of the High Altitude Observatory's coronagraph time-lapse movies of prominences.

The movie seems quite campy now, with primitive animation and with an actor playing "Dr. Research" and the actor Eddy Albert conversing with cartoon Mr. Sun and cartoon Father Time. But there is a lot of good material there, and there is very little I would change even after 45+ years. I didn't have a single scientific objection to the first

half hour or more. The last 15 minutes or so, about solar energy, is the most dated.

Glimpses of some of the scientists of the time--Walter Roberts, Jack Evans, Donald Menzel, and others--appeared.

The quality of the transfer was pretty good. Only occasionally did I notice some film grain or scratches in the corner of the color movie.

The movie was fun to watch. Also on the DVD is "The Strange Case of the Cosmic Rays," another Capra movie in the series.

An eclipse/transit calculator for your mobile phone!

From: Chris O'Byrne To: solareclipsesSENL200311Aula.com Date: Wed, 15 Oct 2003 13:58:55

Folks, I've uploaded an EXPERIMENTAL calculator that should work on any Java-enabled mobile phone! This is a proof-of-concept calculator that I've written to see if modern mobile phones have enough computing power to act as a calculator for eclipse day.

The bad news is that this calculator actually calculates the circumstances of the transit of Venus. And it's not even the 2004 transit - it's the 2012 one! Why did I choose to calculate a transit instead of an eclipse? Because it's easier! And why the 2012 transit instead of the 2004 one? Because the 2012 transit is the one Jean Meeus uses in his (excellent) booklet "Transits" to show how the calculations should proceed.

To install the calculator, you must have a java-enabled portable device (eg mobile phone). Assuming that your phone has internet connectivity, simply point your phone's browser at <http://www.ecliptomaniacs.com/jad/eclipse.jad>, and that should be all there is to it! Your phone will probably ask you if you would like to install an application called "Eclipse" (or, possibly, "Test").

If your phone does not have internet connectivity, and you have another way of installing Java applications on it, then you will need to download the files <http://www.ecliptomaniacs.com/jad/eclipse.jar> and <http://www.ecliptomaniacs.com/jad/eclipse.jad> - to download those files, right-click on the links and choose "Save File As..." in your browser. Note that you will need to download those two files to the same directory on your computer.

If you have a Java-enabled Palm device, you can download and install the file <http://www.ecliptomaniacs.com/jad/eclipse.prc> - NOTE THAT I HAVE NOT TESTED THIS VERSION *AT*ALL*. For more information on java-enabling your plam, see <http://java.sun.com/products/midp4palm/>

OK - so how do you use the calculator? Since there are many different models of Java-enabled mobile phone out there, I can only give general instructions.

SETalk

Obviously, the first thing you need to do is to launch the application. It might appear on your phone as "Eclipse", or it might appear as "Test". The first screen that you see should be asking you for your latitude, longitude and altitude. If your latitude is 23d 14.887' N, you should enter "2314887" as your latitude. If your latitude is 31d 04.590' S, you should enter "-3104590" as your latitude. If your longitude is 102d 31.319' E, you should enter "-10231319" as your longitude. And if your longitude is 91d 30.9' W, you should enter "9130900" as your longitude. Your altitude should be entered in metres.

When you have entered your location, select the "Calc" option. This will place your phone in calculate mode. Before you do this, I would appreciate if you take a note of the time, so that you can email me with how long it typically takes your phone to do a calculation. Send me how long it took between when you hit "Calc" and when you finally got the answer, as well as the make and model of your phone, and any other comments you would like to make. Send them to me at obyrneSENL200311iol.ie - not the list. Thanks.

It takes my Nokia 7250i a few tens of seconds to do a calculation - during this time, you should see a progress bar on the screen. Eventually, you should get the answer back.

For instance (and this is the example that Meeus gives), at latitude 38d 55.283' N, longitude 77d 03.933' W, altitude 84 metres, you should get -

1st Contact

=====
Time: 22:03:48
P: 41.2 degrees
Alt: 25.9 degrees

2nd Contact

=====
Time: 22:21:27
P: 38.7 degrees
Alt: 22.6 degrees

Mid Transit

=====
Time: 01:26:13
Seperation: 542.1"
Alt: -9.7 degrees

3rd Contact

=====
Time: 04:33:01
P: 291.3 degrees
Alt: -27.9 degrees



4th Contact

=====
Time: 04:51:03
P: 288.8 degrees
Alt: -28.3 degrees

The timescale is UT. The angle P is the position angle of Venus measured from the North point on the sun's disk through the East point. Alt is the altitude of the Sun above or below the horizon. And the separation of Venus from the centre of the sun at mid transit is measured in arc seconds.

While the phone is in calculate mode, you can cancel the calculation with the "Cancel" option. If you want to enter a new location, you can hit the "Setup" option. And the "Exit" option should close down the application completely.

If the reports I get back indicate that mobile phones do have enough power, then I intend to write a calculator for use on eclipse/transit day for mobile phones that will do all the calculations and that will provide countdown timers etc. And if some of the phones out there are a bit slow, I think I may be able to re-write the math engine so that it will work faster. Watch this space!

A wee technical detail that I believe I am required to say - this calculator uses a Java math engine written by William Rossi - see <http://sourceforge.net/projects/dfp/> for more information. (Not only can mobile phones not do trigonometry, they cannot even do floating point! Mr. Rossi has written a very good floating point library that gets around this problem). Chris.

3d pix of eclipse

From: KCStarguySENL200311aol.com To: SOLARECLIPSES-SENL200311aula.com Date: Mon, 20 Oct 2003 16:08:20

IN 1972, I first tried to make a tape while in Nova Scotia but the tape started to wind around my legs!!! I junked it and got my nice photos. But in 1973, aboard the Canberra. I got my first recordings along with my photos and they were great. I used in slide shows for many years.

I started videotaping eclipses in 1998 aboard the Galaxy cruiseship and got some great sounds and pictures again too.

Then in 1999 I got what I was really looking for. I videotaped the whole time and got the shadow coming in from over 60 miles away, caught the sights and sounds coming in along with a 360 degree display one minutes before totality. Then I got all of the video through 3rd contact and got outer and inner corona too. That has been my jewel video which I have watched over and over.

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Then in 2001 I got my photo of totality in Africa photographed on Astronomy magazine. The camcorder for the incoming scenes did not work but I did capture my scenery of totality with my other video including my 360 degree display of totality during totality and then caught the shadow bands on tape too.

Finally getting my videos and sounds since 1972 was something I have always wanted to do. The sights and sounds I have for 1998, 1999 and 2001 and the video and sounds I watch frequently with students. I always get those chills and never get tired of those beautiful moments. I now have these sights etc on my webpages. Dr. Eric Flescher (kcstarguySENL200311aol.com)

From: Joel Moskowitz

Eric, Are you going to be on the Croydon flight?

25 october Mercury occultation by new moon

From: Klipsi To: SOLARECLIPSESEN200311AULA.COM Date: Wed, 22 Oct 2003 05:23:19

I just saw that this Saturday 25 October the new Moon, VERY close to the Sun (eclipse one month later), will occult Mercury! What a shame that there is no eclipse!

Can the occultation of Mercury 25 October Mercury occultation by new moon

From: Klipsi To: SOLARECLIPSESEN200311AULA.COM Date: Wed, 22 Oct 2003 05:23:19

I just saw that this Saturday 25 October the new Moon, VERY close to the Sun (eclipse one month later), will occult Mercury! What a shame that there is no eclipse!

Can the occultation of Mercury by the New Moon be observed in a coronagraph? Unfortunately SOHO is outside of the Moon orbit, not between Earth and Moon. So the Moon does not pass in the SOHO field of view. For Geneva the occultation occurs around 14h35, 12h35 UT.

oh, by the way > giant sunspot right now, taking aim straight at us. Get ready for impact! ; -)

From: James Huddle

Klipsi wrote: "oh, by the way > giant sunspot right now, taking aim straight at us. Get ready for impact! ; -)"

This is quite a good target if you wish to test your eclipse

photography or video equipment. The sunspot is large enough to record easily, and it is sometimes easier to set the focus on a sunspot than on the edge of the Sun's disk. It has been mentioned in these annals before, but can hardly be overemphasized, "Practice, practice, practice!" Jim Huddle

From: Dale Ireland

Hello On a related subject..... The umbra will pass close to the earth's surface. Is there any readily available software or online site that gives details about the time and the distance above the Earth's surface for the umbra. It would be interesting to see if any satellites would be passing through the umbra. Dale

From: Klipsi

THAT is a fantastic thought!!!! jeeezzz, so cool! and to correct myself, when I said "what a shame there is no eclipse October 25, we could see the occultation of Mercury", well that is nonsense, because if there was an eclipse, hehe... well during totality the moon would be in front of the Sun and could not occult Mercury half a degree away! stupid me.... ; -) Klipsi

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From: Klipsi

(Continued on page 16)

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Giant sunspot approaching the Sun's centre

From: Gent van R.H. To: HASTRO-
LSEN200311LISTSERV.WVU.EDU Date: Thu, 23 Oct
2003 10:06:59

List members may be interested to have a (safe) look at the Sun during the next few days as a very large sunspot complex is approaching the centre of the Sun's disk.

Cf.

<http://www.spaceweather.com/>
<http://sohowww.nascom.nasa.gov/data/realtime-update.html>

DO NOT LOOK AT THE SUN DIRECTLY AND ALWAYS TAKE PRECAUTIONS TO PROTECT YOUR EYES.

From: jan Vandenbruaene

Here in Belgium, I can see this sunspot very easily with the naked (protected) eye! Almost perfectly in the centre of the Sun. For sure, in history, people had seen this spots on the sun, before the invention of the telescope! Jan

From: Joe Kress

The Chinese observed sunspots via reflection off the surface of a bowl of special ink. They also observed the sun through an atmosphere frequently laden with dust from the Gobi desert. Joe

From: Tom Peters

In fact, a damp hazy atmosphere is perfect too. Yesterday (We. 22 Oct) at 18:00 MEST I happened to watch the Sun in Amsterdam while waiting for a train. At half an hour before sunset the Sun was already a big red ball, and a big spot NE of center was obvious, even though I had not been warned about it. Today at the same time, the weather was better and the Sun was too bright, even when mirrored in office windows.

From: Merry Maisel

Same here, yesterday while in a shoreside restaurant in La Jolla, plenty of clouds, mist, lifting just above the Pacific. Giant "spot" clearly visible at sunset. Merry Maisel

From: Gianni Ferrari

Some news and images are in <http://www.sunspotcycle.com/>
Gianni Ferrari

Live solar images , and northern lights

From: Klipsi To: SOLARECLIPSESEN200311AULA.COM
Date: Fri, 24 Oct 2003 05:10:46

> the various Web addresses for daily solar images

<http://sohowww.nascom.nasa.gov/data/realtime-images.html>

<http://www.spaceweather.com/>

Warning ! get ready for impact today 24 or more likely tomorrow 25 october, as we should get a direct hit from the CME that occurred 23 october and was aiming straight at Earth. Auroral activity is very quiet righ now but will explode in a few hours...

<http://www.sec.noaa.gov/today.html>

<http://www.sec.noaa.gov/pmap/>

<http://www.gi.alaska.edu/cgi-bin/predict.cgi>

Klipsi

From: Klipsi

little correction the october 23 explosion (a rare X5 class, powerful) was not aiming directly at us, but could still trigger auroras. However it was preceded by october 22 CME straight towards Earth. So we are in for geomagnetic storms today, tomorrow. Have a great weekend !

by the way, I would like to invite all to participate in our computer graphic painting contest for the Antarctica eclipse. paint penguins and the eclipse and icebergs. <http://eclipse.span.ch/antarctica2003.htm> click on the PAINT image for info. Tell your kids about it, tell your friends.



SETalk

Satellites eclipsed

From: eclipseclatSENL200311comcast.net To: SOLARECLIPSESENL200311aula.com Date: Thu, 23 Oct 2003 10:17:39

Gut Ottewell documented in his book "Understanding Eclipses" that a Swede observed dimming on a satellite during the Oct 1986 eclipse that skimmed the top of Earth. Raymond Brooks

> > It would be interesting to see if any satellites would be passing through the umbra. Dale

>

> THAT is a fantastic thought !!!! jeeeezzz, so cool ! and to correct myself, when I said "what a shame there is no eclipse october 25, we could see the occultation of Mercury", well that is nonsense, because if there was an eclipse, hehe... well during totality the moon would be in front of the Sun and could not occult Mercury half a degree away ! stupid me.... ;-) Klipsi

From: Dale Ireland

Hi Considering the Earth's inclination I wonder how often geosynchronous satellites pass through the umbra since they get very far above and below the ecliptic and there are lots of them. They are also relatively easy to view since you don't need a clock drive. Dale

From: Glenn Schneider

In 1991 we had a VERY DEEP penetration of HST into the penumbra, by coincidence of the in-track positioning of the spacecraft in its 28-degree inclined orbit and the circumstances of that eclipse. I cannot recall, honestly, if we actually clipped the umbra or not, but it was very close if not. We knew from our orbital predicts that would be the case and planned for it as the spacecraft would have (a) entered into a safemode when the "coarse sun sensors" would have lost the sun and had to disable that piece of protection logic in the flight software and (b) expected and had "anomalous" rates of battery charging on day/night entry/exit do to reduced sunlight. To deal with the later we had to enforce some beyond-normal pointing constraints before and after the eclipse. Back then, while I was in Mexico for the eclipse, HST telemetered all the spacecraft power info (solar array output, battery rates of charge) etc., and I later produced some charts to show this "observation" of the eclipse afterward. They are buried SOMEWHERE under reams of paper in my office. I will see if I can dig them up at some point as that may be of mild interest and I can then add not only "HST Observes the Sun" (http://nicmosis.as.arizona.edu:8000/UVFLOOD/HST_SUN_IMAGE.html) which I've mentioned here before to my web site but "HST Observes a Solar Eclipse" (but there, no images of course), but likely not until TSE 2003 - too much work yet to do before that one.

The point, I think, is that there are at least SOME (I would say nearly all) missions that are cognizant of the effect of eclipses on their spacecraft, and many will do what is necessary, preventively, to protect them. Glenn Schneider

From: Jay.M.PasachoffSENL200311williams.edu

What Glenn points out they did to safeguard HST in 1991 wasn't done, by mis take, for Yohkoh a couple of years ago (even though it was a solar spacecraft), and it went out of control and died.

From: Dale Ireland

Glenn Thanks for that interesting post. I know that the operators of geosynchronous sats are well aware of the problem. These satellite's orbits, being more or less above the equator, are inclined to the ecliptic and they only experience eclipses by the earth around the equinoxes so they plan and publish the times. They don't seem to have much concern about passing through the Moon's umbra however as the passages must be quite brief. It seems that it would be possible to observe this in a dark sky if it occurred but my software doesn't have the capability of predicting such passes and I wonder if the technicians who operate the geosynchronous or other sats make those calculations? Dale

From: Gerard M Foley

(Continued on page 18)

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They are, of course, all eclipsed daily by the earth. For several days running in the spring and autumn they transit the sun daily. At such times radio frequency from the solar spectrum overrides the satellite signal at the terrestrial receivers I don't know if the signals from the Direct Broadcast Satellites are strong enough to overcome the solar noise. Maybe some subscriber to a DBS could tell us. An eclipse by the moon would presumably be noticed by the operator, since the solar panel voltage would experience a glitch, even in the day sky.

A lunar eclipse observed visually would occur between twilight and the eclipse of the satellite by the earth. Since the geostationary satellites are nearly in the equatorial plane, the eclipses would be around the lunar nodes. Thinking about the geometry, I wonder if the umbra of the moon would ever reach such a satellite when it was in a dark sky. It would be very low in the sky to be closer to the moon than the center of the earth is. I'm sure Jan Meeus, if he wished, could tell us exactly when a particular satellite would be eclipsed by the moon! Gerry

From: Glenn Schneider

I really know nothing about privately operated geosync satellites, and non-US missions. Support for most missions from NASA/Goddard comes from the Flight Dynamics Analysis Branch:

<http://fdab1.gsfc.nasa.gov/live/What^20We^20Do/default.asp?proxyid=0&menu=1>

HST has its own set of of planning tools to augment that. The apriori knowledge of solar eclipses on the spacecraft power (and sun sensor) systems are recognized and watched for.

The loss of Yohkoh that Jay mentioned took me (and many others) by complete surprise (as a complete outsider to that) - particularly as it was a solar mission! -GS-

From: Michael Gill

Raymond, This was Russell Eberst of Edinburgh.

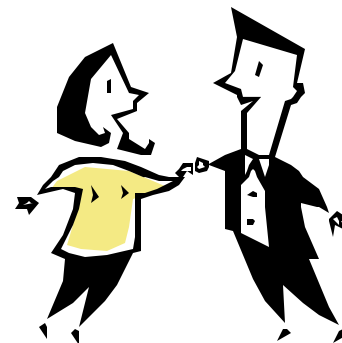
See the entry for October 3 in Patrick's Solar Eclipse Calendar:

http://solareclipsewebpages.users.btopenworld.com/SECalendar_files/SECalendar.PDF

Cheers, Michael Gill

From: Dale Ireland

Gerry At the new Moon immediately following this coming total eclipse the umbra passes just south of the Earth. Because it is near the winter solstice the geosats will be also be south of the ecliptic when they are on the night side of earth where you could see them well. A geosat that sits permanently (day and night) right on my meridian would be at its maximum miles below the ecliptic (south of the earth) at midnight. If this coincides with the new Moon the satellites would pass through the Moon's shadow possibly. Problem is that they would also be further from the Sun than the earth and thus beyond the termination of the umbra and would see an annular eclipse at best. I just heard that Robert Matsons free satellite tracking software SkyMap 6.5 can do these calculations but I haven't had time to play with it yet. Dale



New Moon Oct 2003

From: eclipseclatSENL200311comcast.net To: SOLARECLIPSESENL200311aula.com Date: Thu, 23 Oct 2003 10:22:56

New Moon this month is October 25, 2003 at 12:51 UT

There has been some recent discussion about the New Moon this month being nearly an eclipse. The Earth and Sun are aligned on the Moon's descending node November 11. The October New Moon is 17 days prior to this alignment while the November TSE is

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only 12 days following alignment; thus October New Moon closely misses top of Earth while November barely contacts bottom of Earth.

All the New Moons in the six months since the May 31 have been high passes over the Sun. The New Moons of May, June and July are new saroses approaching Earth's limb (same is true for those Full Moons vis -à-vis lunar eclipses). The New Moons of August, September & October are exhausted saroses leaving Earth's limb (Full Moons for those months formerly were lunar eclipses which also exhausted their saroses.)

For those interested, I can send a copy of my Saros Diagram for 2003 illustrating this.

Since the New Moons of October and November roughly split Sun-Earth-Moon node alignment, the Full Moon November 9 (which is midway between each New Moon should roughly coincide with node alignment and be a Lunar Eclipse and, of course, it is; a deep total lunar.)

New Moon a few days from now is in Saros 114 which has had four large close New Moons just miss Earth in 1949, 1967, 1985 and 2003. The last hit was a partial in the Arctic in 1931.

This New Moon misses the Sun with a magnitude of minus 0.254 (positive would be a partial). If someone were 500 miles above Earth's limb they could witness a partial solar eclipse. It is relative number 38 (38 saros increments since the central pass in July 1264). The series had 16 hybrid eclipses (unusual) preceded by 13 annulars and followed by 17 totals.

The shadow of next week's new Moon at the Earth's Vertical Centerline is 68 miles in diameter and would allow someone to witness a 1 minute 47 second total solar eclipse if positioned 1500 miles above the Earth's limb as the shadow rushed by at 2,304 mph. The shadow cone extends almost 7,355 miles (about 2 radii) beyond the center of Earth. Raymond Brooks

From: klipsi@SEN200311bluewin.ch

well, hi Ray, not really a very deep one. It is total alright, but not a long one, not deep into the center of the umbra. July 2000, now THAT was a deep lunar eclipse ! November 9 totality is quite short by comparison. Klipsi

From: eclipse@clatSEN200311comcast.net

Klipsi; I consider it deep, here is why.

Living on the Moon: an unnoticable (from Earth) penumbral eclipse would appear as a partial eclipse of the Sun.

a partial lunar would be a total eclipse of the Sun if your house was in the umbral area.

any total lunar would be a total-total eclipse of the Sun..every house on the Moon would see a total solar eclipse at one instant... so all total lunars are quite deep in my view, despite their variation. Ray Brooks

NASA Scientist Dives Into Perfect Space Storm

From: Ron Baalke To: HASTRO-LSENL200311LISTSERV.
WVU.EDU Date: Thu, 23 Oct 2003 17:35:49

Donald Savage Headquarters, Washington October 23, 2003
(Phone: 202/358-1547)

DC Agle Jet Propulsion Laboratory, Pasadena, Calif. (Phone: 818/393-9011)

RELEASE: 03-344

NASA SCIENTIST DIVES INTO PERFECT SPACE STORM

Newly uncovered scientific data of recorded history's most massive space storm is helping a NASA scientist investigate its intensity and the probability that what occurred on Earth and in the heavens almost a century-and-a-half ago could happen again.

In scientific circles where solar flares, magnetic storms and other unique solar events are discussed, the occurrences of September 1-2, 1859, are the star stuff of legend. Even 144 years ago, many of Earth's inhabitants realized something momentous had just occurred. Within hours, telegraph wires in both the United States and Europe spontaneously shorted out, causing numerous fires, while the Northern Lights, solar-induced phenomena more closely associated with regions near Earth's North Pole, were documented as far south as Rome, Havana and Hawaii, with similar effects at the South Pole.

"Remarkably, science has documented solar events a hundred times more intense," said Dr. Bruce Tsurutani, a plasma physicist at NASA's Jet Propulsion Laboratory in Pasadena, Calif. "But none of them interacted with the Earth in such a violent manner. What happened in 1859 was a combination of several events that occurred on the Sun at the same time. If they took place separately they would be somewhat notable events. But together they create the most potent disruption of Earth's ionosphere in recorded history. What they generated was the perfect space storm," he said.

To begin to understand the perfect space storm you must first begin

SETalk

(Continued from page 19)

to understand the gargantuan numbers with which plasma physicists like Tsurutani work every day. At over 1.4 million kilometers (869,919 miles) wide, the Sun contains 99.86 percent of the mass of the entire solar system: well over a million Earths could fit inside its bulk. The total energy radiated by the Sun averages 383 billion trillion kilowatts, the equivalent of the energy generated by 100 billion tons of TNT exploding each and every second.

But the energy released by the Sun is not always constant. Close inspection of the Sun's surface reveals a turbulent tangle of magnetic fields and boiling arc-shaped clouds of hot plasma dappled by dark, roving sunspots.

Every once in a while -- exactly when scientists cannot predict -- an event occurs on the surface of the Sun that releases a tremendous amount of energy in the form of a solar flare or a coronal mass ejection, an explosive burst of very hot, electrified gases with a mass that can surpass that of Mount Everest.

What transpired during the dog days of summer 1859, across the 150 million-kilometer (about 93 million-mile) chasm of interplanetary space that separates the Sun and Earth, was this: on August 28, solar observers noted the development of numerous sunspots on the Sun's surface. Sunspots are localized regions of extremely intense magnetic fields. These magnetic fields intertwine, and the resulting magnetic energy can generate a sudden, violent release of energy called a solar flare. From August 28 to September 2 several solar flares were observed. Then, on September 1, the Sun released a mammoth solar flare. For almost an entire minute the amount of sunlight the Sun produced at the region of the flare actually doubled.

"With the flare came this explosive release of a massive cloud of magnetically charged plasma called a coronal mass ejection," said Tsurutani. "These things actually fire out from the Sun radially, so not all of them head toward the Earth. But those that do usually take three to four days to reach Earth. This one took all of 17 hours and 40 minutes," he noted.

Not only was this coronal mass ejection an extremely fast mover, the magnetic fields contained within its charged particles were extremely intense and in direct opposition with Earth's magnetic fields. That meant the coronal mass ejection of September 1, 1859, overwhelmed Earth's own magnetic field, allowing charged particles to penetrate into Earth's upper atmosphere. The endgame to such a stellar event is one heck of a light show and more -- including potential disruptions of electrical grids and communications systems.

Back in 1859 the invention of the telegraph was only 15 years old and society's electrical framework was truly in its infancy. A 1994 solar storm caused major malfunctions to two communications satellites, disrupting newspaper, network television and nationwide radio service throughout Canada. Other storms have affected systems ranging from cell phone service and TV signals to GPS systems and electrical power grids. In March 1989, a solar storm much less intense than the perfect space storm of 1859 caused the Hydro-Quebec (Canada) power grid to go down for over nine hours, and the resulting damages and loss in revenue were estimated to be in the hundreds of millions of dollars.

"The question I get asked most often is, 'Could a perfect space storm happen again, and when?'" added Tsurutani. "I tell people it could, and it could very well be even more intense than what transpired in 1859. As for when, we simply do not know," he said.

To research this perfect space storm, Tsurutani and co-writers Drs. Walter Gonzalez, of the Brazilian National Space Institute, and Gurbax Lakhina and Sobhana Alex, of the India Institute of Geomagnetism, used previously reported ground, solar and auroral observations, and recently re-discovered ground-based magnetic-field data from Colaba Observatory in India. The findings were published in a recent issue of the Journal of Geophysical Research.

For more information on the Internet, visit: <http://sse.jpl.nasa.gov/planets/> <http://www.nasa.gov> -end-

On the shortest time lap between two totalities in the same place

From: luca quick To: solareclipses@SENLA200311Aula.com Date: Mon, 20 Oct 2003 15:14:18

The shortest time interval between two total eclipses is approximately 12 months.

In some rare cases, the two totality bands can cross and it is then possible to experience totality in the same place in a little less than a year. For example, the totality band of the total eclipse of 2045 Aug. 12 and that of the eclipse of 2046 Aug. 2 cross off the coast of Brazil (J. Meeus, *Astronomical Morsels*, ch. 14).

But the shortest time interval between a total eclipse and an hybrid eclipse or between two hybrid eclipses is approximately 6 months. For example, the hybrid eclipse of 2067 Dec. 6 and the total one of 2068 May 31 or the two hybrid eclipses of 2049 Nov. 25 and of 2050 May 20 (J. Meeus, *Astronomical Morsels*, ch. 10).

In the case of these two kinds of couples of eclipses (6 months apart, one total and one hybrid or 6 month apart, two hybrid eclipses), if the segments of band where the two eclipses are total crossed, it would be possible to experience totality in the same place in a little

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less than a semester, the shortest time possible (two central eclipses can never be 1 month apart).

My question is about the theoretical possibility of such an event. Please, could anyone give an example of such an event or give theoretical arguments which prevent such an event to take place? Luca QUAGLIA

From: Michael Gill

Dear Luca, There is nothing that prevents there being two total solar eclipses occurring at one location six lunations apart.

For this to occur, one eclipse must be obviously be total (TSE), the other a hybrid (HSE) with the two tracks intersecting along the portion of the HSE track where the eclipse is total.

I can cite the following eclipses, separated by 176 days:

-1452 Jan 28 (a HSE)
-1452 Jul 22 (a TSE)

Although the value of delta-T is not exactly known for that distant epoch, those two tracks did intersect.

FWIW, Emapwin shows this point of intersection being in the Atlantic Ocean in the vicinity of the Gulf of Guinea, latitude -2.58, longitude -3.26.

A similar thing occurred one saros later with the HSE and TSE in the year -1434.

Perhaps someone would care to undertake a more exhaustive search and look for all such events that occur within a few millennia +/- today? Cheers, Michael Gill

From: Jean Meeus

Dear Luca, I have investigated the period from -1200 to the year +3400. And, yes, it is possible to see two total solar eclipses from the same place with a time interval of only 6 lunations, although that is very rare.

The surprise is that it does NOT occur between the years 1400 and 2900. But it took place no less than six times during the 14th century, namely at the annular-total eclipses of the years 1300, 1318, 1336, 1354, 1372, and 1390. This is at intervals of one saros! And for the next occurrence we have to wait until the year 2964, when the path of the total eclipse of 2964 April 3 will cross the totality part of the annular-total eclipse of 2964 September 27.

Contrary to what Michael Gill wrote, it is *not* necessary that one of the two eclipses be a pure total eclipse. In the above-mentioned series 1300-1390, all eclipses are annular-total.

It is my intention to give more details about the subject in my future 'Morsels' book (the third), which I hope to prepare next year. Jean Meeus

From: Michael Gill

Dear Jean, Thanks for that correction. I look forward to the third installment of "Morsels".

Best regards, Michael Gill

From: eclipseclatSENL200311comcast.net

Curiously, the overlap sequence described by Jean is saros 109 and 114. Saros 114 is the series that tomorrow's New Moon is in (as noted in my recent email for this month's New Moon.

Saros 114 had 13 annulars then 16 hybrids then 17 totals. Saros 109 running concurrently with 114 was reversed with 24 totals then 15 hybrids then 4 annulars. Raymond Brooks

HUGE PROMINENCE THIS MORNING

From: Klipsi To: SOLARECLIPSESENL200311AULA.COM
Date: Sun, 26 Oct 2003 05:44:40

Soho image momentarily showed a HUGE prominence this morning

http://150.144.30.101/data/realtime/javagif/gifs_small/20031026_0119_eit_304.gif

WOWW !!!!!!!!!!!!!!!

Olivier "Klipsi" Staiger

From: Jean-Paul GODARD

Look at C2 pictures... http://150.144.30.101/data/realtime/javagif/gifs_small/20031026_0330_c2.gif Huge!!!

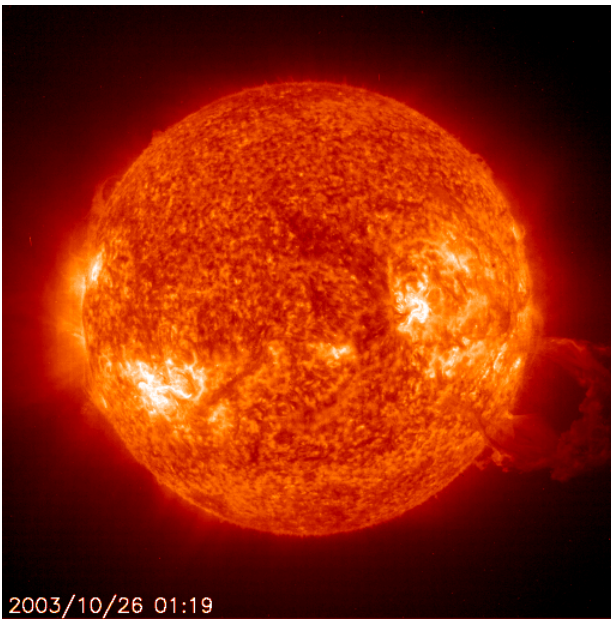
Waiting for auroras tonight!

Cordialement, Martine & Jean-Paul

From: Klipsi

http://150.144.30.101/data/realtime/javagif/gifs_small/20031026_0119_eit_304.gif

SETalk



2003/10/26 01:19

huge prominence 20031026_0119_eit_304

I LOVE coincidences !
such as the time this image was taken .
01.19 UT
1.19

should we call 911 ??? ;-) Klipsi

From: Brian Garrett

Thank goodness for the [SEML] tag in the headers. For a moment I thought I was being hit with another spam for something to help enlarge *my* prominence :)
Brian

From: klipsiSENL200311bluwin.ch

maybe better the following night ? I believe when a CME occurs it takes 2 days to reach Earth. And also, it better be Earth-directed. As we see it is on the edge, we may not get it, or just a bit

From: Robert B Slobins

Klipsi: Chill! I had been following this prominence for the past several days. It preceded AR10484 and it looked overextended and unstable. This sent off a CME. Figure 36-48 hours' travel time for arrival at 18:00 UTC on 27 October through 06:00 UTC on 28 October.

I suggest for better info one needs to go to www.

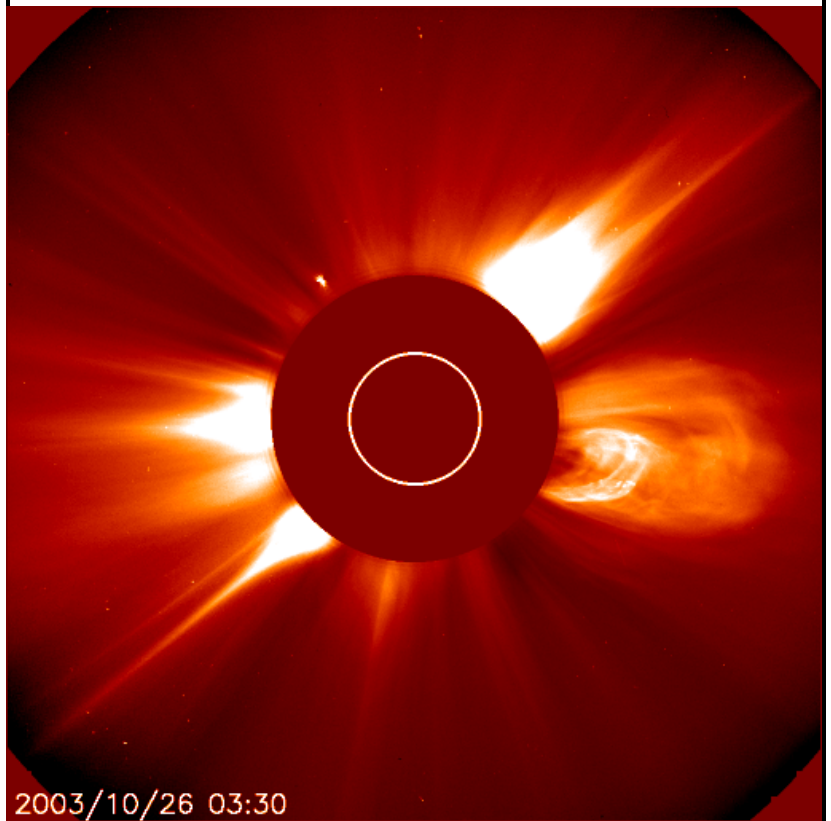
spacew.com. If anyone wants to understand space weather and solar physics, this is the site of first choice.

The X1.1 flare that went off from AR10486 this morning may have a better chance of getting us. The problem is that the sun is a rather lazy star with poor aim. ;-)

Now to go off and run some Velvia through the camera, as we got lucky in Indiana and we do see the sun. cheers/rbs

From: Carter Roberts

Hi, I was about an hour north of San Francisco to help with an astronomy program. I set up my Coronado 'scope for the group at about 0050 UT when the Sun was only 4-5 degrees above the horizon. We were amazed by the size of that prominence. I tried to look after every couple of people since I needed to re-center the Sun in the field anyway and I was amazed at how rapidly it changed. I have never see a prominence change like that. I hope someone got a sequence of images. As the altitude of the Sun decreased it got somewhat harder to see but we watched it until Sunset which was just about when the SOHO image was taken (0119 UT). Clear Skies, Carter Roberts

huge prominence 20031026_0330_c2

2003/10/26 03:30

SETalk

Eclipse on Good Friday avoided, another related question

From: Bob Garfinkle To: HASTRO-LSENL200311LISTSERV.WVU.EDU Date: Mon, 13 Oct 2003 08:54:30

Hi Jan, Thank you for your take on this issue. This is not my area of expertise, so has anyone (now or in the past) searched the Vatican archives, or other verified Church records, and published any account for this fear of an eclipse on Good Friday? It does seem strange, since many people claim that the reported darkness at the crucifixion was a solar eclipse. I know that this has mysterious Good Friday solar eclipse been discussed on this list in great detail over the past few months.

Question for you astronomical calendar experts on the list: Has there ever been a lunar eclipse on a Good Friday? If so, when? If so, what type?

Take care. Bob Garfinkle

Such decision of the Council of Nicea isn't attested. It's only a bold hypothesis. Nevertheless, many discussions continued during the 4th to 7th centuries, at what time of night is the paschal full moon to occur to be the "true" paschal full moon capable to shine down properly during the feast. It had consequences for limits of early Easter tables. The arguments were purely theological and mystical. You can see the analogy with the purported fear of paschal eclipse here - such eclipse could detract much from the holiness of the Easter, if you accept the way of such thinking.

But I repeat that such fear is a pure hypothesis, without any proof in historical sources, if I am not wrong. Jan Kalivoda

From: Gent van R.H.

In his *"More Mathematical Astronomy Morsels"* (Willmann-Bell, Richmond, 2002), chpt. 25, Jean Meeus discusses when a lunar eclipse occurs on a Easter Sunday for the period 1583 to 3000 according to the Gregorian Easter rules. This occurs 33 times, most recently in 1995 (April 16) and the next such occasion will be in 2015 (April 5).

A similar calculation for the years between 1000 and 1582 (with the Dionysian Easter rules) resulted in NO coincidences.

Meeus did not look for lunar eclipses on Good Fridays in his study.

From: Raoul Mårtens

How about solar eclipses? Nils Hansson's theory probably also included solar eclipses. Sincerely Raoul Martens

From: Tom Peters

Good Friday happened at Pesach, which is celebrated at Full Moon - when the Moon is in opposition to the Sun. A lunar eclipse is then possible, but a solar eclipse (conjunction with the Sun) not.

From: Smerillo

There are many documents that go back much further, to Otto I (962) and to Charlemagne, but these are diplomatic records, kept in the so-called "Secret Archives" which is no more than a private archive of the occupants of the Papal throne, hence now a State archive.. The archives were separated from the Library in 1612. The bulk of material lost was pillaged by that French Grand Bastard Napoleon Bonaparte, about 500 MSS.

The Vatican Library (Biblioteca Apostolica Vaticana) was founded in 1451 by Nicolas V as a collection of scholarly books (MSS) "for the convenience of the learned" and expanded by many later acquisitions. The original library contained 3000 titles.

The library houses now about 150,000 MSS,[*] 2Million + printed books, 8000 incunabula, 100,000 drawings, maps and prints; and 150,000 autograph folios

(Continued on page 24)

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[*]60,000 Latin; 2300 Greek; 800 Hebrew; 1200 Arabic; 4500 Chinese; plus thousands in Armenian, Ethiopian, Boharic, Turkish, Persian, Irish, Old Norse, Licelandic, Japanese and other languages. Any MSS work which has been edited and published is available in the Library, and more as well.

When and where and with whom did an understanding and predictability of the geographical visibility of eclipse occurrence become current? feliciter, Lorenzo Smerillo Research Lector Late Antiquity Biblioteca Nazionale Protocenobio Sublacense (ROMA)

From: Smerillo

Could he though?

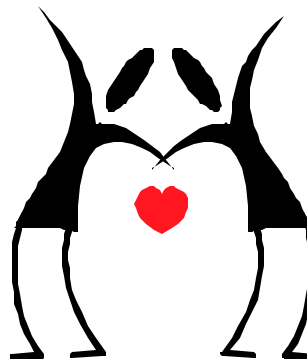
Did he though?

Was it known?

Was it used?

If so, by whom and when and where?

feliciter, Lorenzo Smerillo



From: Tom Peters

Hipparchus was the first (about 140 BC) to develop a quantitative geometric model of the orbits of the Sun, Earth and Moon, which could have allowed him to actually compute the appearance of a solar eclipse for a specific geographical location.

From: LARRY KLAES

Just out of curiosity, and for the sake of future historians and our culture, are copies of the Vatican Records kept somewhere else? Larry

From: pbellemaSEN200311AIX1.UOTTAWA.CA

Among other things, you do not have to go very far to find critical editions of ancient texts, scientific or otherwise, that will include a Vaticanus manuscript or another (and often more than one) in their apparatus criticus. Documents of general interest kept in the Vatican collections have been available to serious scholars for centuries and those have made ample use of them. It is the access to the... uh... corporate archives of the Church that - to a certain extent, at least - is restricted. Pierre Bellemare

From: Bob Garfinkle

Hi HASTRO-L List, Thanks to all who have contributed messages about the Vatican library and other Vatican archives, but my primary question is still on the table. Has anyone ever written a scholarly paper, book, or article on why the Church wishes to avoid the occurrence of a lunar eclipse on Good Friday? If so, please give the reference.

At this point in the thread, I forgot who first brought up the point that the Church wanted to avoid a lunar eclipse on Good Friday, so they therefore have manipulated the calendar to make that avoidance a reality. I am simply looking for evidence of the truth or falsehood of that "avoidance" statement.

I was also hoping that maybe somebody on this list, especially anyone who is near Rome, could check to see if the Church has ever published such a document. I guess that it is safe to assume that if the Church was truly opposed to having a lunar eclipse on Good Friday, for whatever reason, there would be some Church document discussing it. Take care. Robert A. Garfinkle, F.R.A.S.

From: Gent van R.H.

It may be of interest to note that the "crucifixion eclipse" is one the three "unnatural" eclipses mentioned in the "Book of Sidrak and Bokkus", a Middle English verse adaptation of an Old French collection of questions-and-answers on a great variety of topics. This

(Continued on page 25)

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work, which is believed to date from the 13th century, enjoyed some popularity in the Middle Ages as it was also translated into Italian, Danish and Dutch.

In this book, king Bokkus (a descendant of Japhet who is stated to have lived some 850 years after the death of Noah), raises numerous questions on man, God, the earth and the universe which are all answered by the philosopher Sidrak.

When discussing the nature of eclipses and how they are caused, Sidrak concludes with the observation:

Other eclips iij we fynde Of the sonne ayenst kynde: Ooon cam in tyme of Noe Ayens that the dyluuy shold be; Another shal be, sothe to say, In tyme that Goddys Sone shall day; And in the birthe shall be the thridde Of Antecriste, as shal be kydde.

Does anyone on the list know where the tradition of a solar eclipse (natural or not) announcing Noah's Deluge comes from?

The "Book of Sidrak and Bokkus" contains numerous other questions-and-answers on astronomy, astrology and cosmogony that should interest members of this list, such as: "how far away are the stars and how many are there", "why is the Moon cold and the Sun hot", etc.

The "Book of Sidrak and Bokkus" is available in the following edition:

T.L. Burton, *Sidrak and Bokkus: A parallel-text edition* from Bodleian Library, MS Laud Misc. 559 and British Library, MS Lansdowne 793_ (Oxford University Press, Oxford, 1998-1999 [= *Early English Text Society*, O.S., 311-312]), 2 vols.

From: Raoul Mårtens

Precisely: a solar eclipse on Good Friday was per definitio excluded, something the Church Fathers presumably knew, and thus a pillar of the Nicean Easter Rule. It seems unlikely that they didn't think the same as regards lunar eclipses, particularly because these often occur near the equinoxes. An investigation of eclipse records may provide an answer. Sincerely Raoul Martens

From: pbellemaSEN200311AIX1.UOTTAWA.CA

If that is the case and there is an official policy, you do not need someone near Rome for that. The library of any medium-sized to large Catholic institution should hold the answer. Indeed, any old missal would hold the answer, inasmuch as they usually included the tables used to calculate

the date of Easter - with the motions of the moon being one of the essential parameters.

Why don't you check Lambertini? Prospero Lambertini was a learned canonist in the 18th century (he later became archbishop of Bologna, and then Pope as Benedict XIV). He published, among other things, a well-informed book on the feasts of Mary and Jesus in the calendar. You may find the answer there.

At the same time, I have a feeling that what you are looking for is merely a corollary to the famous decision made by the council of Nicaea, in the early 4th century, regarding the date of Easter in relation to that of Passover. That is well-known and any book dealing with that important council (there are several, in various languages) should provide you with the details.

In any event, resources about the comput - the ecclesiastical science of the calculation of the date of Easter - are easy to find. For a starter, I suggest that you take a look at either *LE DICTIONNAIRE DE THEOLOGIE CATHOLIQUE* or *LE DICTIONNAIRE D'ARCHEOLOGIE CHRETIENNE ET DE LITURGIE* If you do not know French, the *CATHOLIC ENCYCLOPAEDIA* (various editions) should provide a good introduction to the issue. The key technical word is *COMPUT*. I hope this helps. Pierre Bellemare

From: Rocky Berlier

Also look for Computus.

A comprehensive introductory source can be found at:

http://en2.wikipedia.org/wiki/First_Council_of_Nicaea

<http://en2.wikipedia.org/wiki/Easter>

<http://en2.wikipedia.org/wiki/Computus>

Warm regards, Rocky Berlier

From: Joe Kress

Although I don't remember a solar eclipse being specifically mentioned, one possible route is the conjunction of all planets (including the sun and moon) at the beginning of the current Kali Yuga (Iron Age) in Hindu astronomy. This epoch, midnight 17/18 February 3102 B.C. Julian, was called the "Deluge" (Noah's flood) by most mid East chronologists, both Muslim and Christian, during the Middle Ages. Joe Kress

From: Michael L. Gorodetsky

In a couple of minutes I found that in fact there were a lot of lunar eclipses on Good Friday. Here is the list of only total lunar eclipses: 358/ 4/10; 405/ 3/31; 452/ 3/21; 730/ 4/ 7; 777/ 3/28; 879/ 4/10; 889/ 3/21; 973/ 3/21; 1410/ 3/21; 1606/ 3/24; 1772/ 4/17; 1978/ 3/24; For

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the first three cases the Easter could be celebrated on other dates than according to Dionissius method of calculation. I have not checked. After 1582 I used Gregorian Easter. Best regards, Michael mailto:gormSENL200311hbar.phys.msu.ru

From: Bob Garfinkle

Hi List, Thanks again for the tips this morning.

I am in the process of writing a major lunar observer' handbook and this whole thing of figuring out how to avoid a lunar eclipse caught my attention. Its an interesting tid bit of information that I might add to my chapter on observing eclipses. Take care. Robert A. Garfinkle, F. R.A.S.

From: Bob Garfinkle

Hello List, Regarding the question of the Church "avoiding a lunar eclipse on Good Friday, the following is Guy Consolmagno's reply to me:

-----Original Message----- From: Br. Guy Consolmagno SJ

Hi Bob-- Anyway, I'm not an expert on history of calendars, but this sense of "avoiding a lunar eclipse on Good Friday" sounds bogus to me. The idea was to duplicate Easter as a Sunday near Passover (which is a full moon). By being near Passover, obviously you're never going to be near a lunar eclipse. But there is nothing particularly special about eclipses otherwise. The Church has always been opposed to anything that even smacks of astrology.

The whole point of the arbitrary formula adopted in 1582 for setting the date of Easter is that religious holidays are "not" determined by the positions of the planets but are set by humans, in the spirit of "the Sabbath was made for man, not man for the Sabbath." --Guy

For those of you who do not know of my friend, Brother Guy Consolmagno, he is the author or co-author of a couple of astronomy books, including "Turn Left at Orion" and "Brother Astronomer." He is an astronomer at the Vatican Observatory, and his the curator of their meteorite collection.

I too thought that this avoiding a Good Friday lunar eclipse was strange and wanted to hear any expert opinions on the validity of this issue.

Since the time that I received Guy's message, we all

should have received the message from Michael L. Gorodetsky [gormSENL200311HBAR.PHYS.MSU.RU], in which he lists a bunch of Good Friday lunar eclipses going back over 1600 years or so. Thank you Michael for your input.

I assume that this should put this issue to bed, unless someone else has other items to add to the discussion (always welcome as far as I'm concerned). Take care. Robert A. Garfinkle, F.R.A.S.

From: Owen Gingerich

Of course my friend Guy Consolmagno intended to say that there would not be any SOLAR eclipses near the time of Passover/Good Friday/Easter. OWEN GINGERICH

From: Simon Cassidy

Simon Cassidy notes: I'm sorry but I cannot let this absurd statement pass without correction. While admitting he is not an expert, Guy Consolmagno is apparently hopelessly ignorant of the history of the Gregorian calendar reform.

The whole point of the formula adopted in 1582 was to bring Easter back into conformity with the true positions of Sun and Moon, based on the tradition that easter should reproduce the assumed solilunar configuration of the original Passion (first full moon after the vernal equinox).

If the real spirit of Pope Gregory's Calendar Commission had been as Guy states then they would have seen no need for any change to the civil calendar or the Easter computus.

From: Owen Gingerich

There is truth in both of these statements, but some fine tuning is needed. The principal argument before the Calendar Commission was whether to use true positions (as Clavius originally maintained) or mean positions. When ultimately the Commission decided to use mean positions so that Easter could be definitively computed in advance by tables ("computus"), many Protestants (such as Kepler's teacher, Michael Maestlin) objected vehemently that true positions were not used. Kepler, however, wrote that "Easter is a feast, not a planet," much to Maestlin's annoyance. (Kepler's specific statement was not made public till long afterward, but Maestlin was peeved that Kepler didn't get in line with the Protestant critique of this popish invention.) OWEN GINGERICH

From: Rick Levine

Owen, Do you know where Kepler wrote this? It's a wonderful quote and I'd like to be able to cite it. Thanks, ~ Rick Levine

From: Tom Peters

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SETalk

This apparently was discussed in this list late in 2001; Rob H. van Gent cross-posted the results to the CALNDR-L mailing list on 23 Dec. 2001:

Hi all, I can inform you that with the help of the HASTRO-L discussion group I have been able to confirm that the Kepler quote

"Ostern ist ein Fest vnd khein Stern" [Easter is a feast, not a planet] is genuine.

The quote occurs in an unpublished paper written in German in 1613 by Kepler and entitled "Ein Gespräch von der Reformation des alten Kalenders worauff die Correctio Gregoriana gegründet". A Latin translation of this paper was published by M.G. Hansch as "Liber singularis de Calendario Gregoriano sive de reformatione Calendarii Juliani necessaria et de fundamentis atque ratione correctionis Gregoriana" (Leipzig, 1726), during a period when calendar reform and Easter calculations were a hotly discussed topic in the German-speaking parts of Europe.

So far, the German text of this paper has only been published as the "Dialogus de Calendario Gregoriano" in the Frisch edition (1858-1871) of Kepler's collected works (Joannis Kepleri Opera Omnia, vol. 4 [1863], p. 37).

You do not have to take my word for this and can easily check it for yourself as the complete text of the Frisch edition is available at the Gallica website

<http://gallica.bnf.fr/>

List members with an interest in Near-Eastern calendars and chronology should also note that the Gallica website offers a complete digital scan of E.C. Sachau's English translation of al-Biruni's important treatise on calendars and chronology commonly referred to as "The Chronology of the Ancient Nations" (written around 1000) as well as other historical publications of calendrical interest. Regards,

From: Owen Gingerich

Since Rob van Gent sent the message to the list, the German text is now included in a recently published volume of the Kepler Gesammelte Werke, vol. 21,1 and is found at the top of p. 378. OWEN GINGERICH

From: Simon Cassidy

Simon Cassidy notes: Michael Gorodetsky's list (below) of Good Friday total eclipses of the moon (by the Earth) is noteworthy for its switch from the Julian Computus to the Gregorian Computus after A.D. 1582. This has the effect of masking what may be the reason behind statements which suggest that the Computus could "exclude the possibility of an eclipse on Good Friday", (referring, it is assumed, to lunar eclipses).

If instead of switching to the Gregorian computus after 1582 we continue to use the old Julian computus we will find such (Julian) Good Friday eclipses becoming rare and being currently nonexistent for many millenia. They will reappear only when the ~3 day error per millenia, in the length of the Julian ecclesiastical lunation, shifts the phase of the ecclesiastical full moons through most of a whole lunation (wrt to the true full moons).

In an ideal computus (where the Paschal full moon always coincides with the day of the true full moon at some reference meridian) Good Friday (two days before Easter Sunday) can only occur in a seven day moon-phase interval, from one day prior to full moon (Luna 13) up until five days after (Luna 19).

The use of mean full-moons in a "practical" computus widens this by a couple of days (as in the Gregorian computus) but any computus (like the Julian) which also has a relatively substantial error in its mean ecclesiastical lunation length will inevitably cause the 7-10 day window of reachable moon-phases (for Good Friday) to soon drift away from the possibility of a true full-moon (and hence away from the possibility of any lunar eclipse). BTW the fact that the Julian computus error overestimates the lunation causes this to happen much sooner than if its error had been an equivalent underestimation.

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Thus I can imagine, for instance, an Eastern Orthodox calendarist arguing for their retention of the Julian computus on grounds that might include the fact that it does prevent a Good Friday lunar eclipse for many millenia hence (perhaps this came up due to the recent WCC discussions of a purely astronomical Easter computus?).

Julian Good Friday SOLAR eclipses will however become possible rather sooner (a date for the first such occurrence is left as an exercise for the reader). Yours, Simon Cassidy.

From: Raoul Mårtens

As Dionysius (Exiguus) lived c. 500 AD, calculation of lunar eclipses 50-150 years earlierly acc. to his methods, appears hardly probable. For the first three cases (occurring after the Nicaean Council in 325) the question is what method of calculation was used. The dates for all eclipses presented seem to be Gregorian acc. to an eclipse program. Julian calendar Good Fridays also vary acc. to the full moon dates F.i. the eclipse Gregorian Good Friday March 24 1978, occurred. March 11.in the Julian calendar, whereas, acc. to the Easter Rule, Good Friday then fell on April 15, i.e. the events did not coincide. Checking also the other eclipses may probably give similar results. Hetherington's A Chronicle of Pre-Telescopic Astronomy at 45 BC, the Julian calendar starting year, says that "the year started in March"

but the vernal equinox datum, its turning point, is not specified here. One may presume that the vernal equinox date was decided arbitrarily by the Pontifex Maximus (Caesar-the Emperors-the Pope). in order that an eclipse at the start of a new year could be ignored. Systematic observation of spring lunar eclipses may have created an impression that such eclipse would not occur on Good Friday; so fixing the vernal equinox at March 21 perhaps looked 'safe'.

Acc. to <http://home.nordwest.net/hgm/kalender/kal-3.htm>, the vernal equinox was fixed at March 21 by pope John I in 525 AD pursuant to a proposal by Dionysios Exiguus implying that Easter Day occurs between March 22 and April 25, i.e. similar to the Gregorian calendar. Also, the rule is said to apply only to vernal equinox on the northern hemisphere. (Tag-und-Nacht-Gleiche auf der nördlichen Halbkugel) As the three first eclipses and many of the rest were visible only south of the equator, the clergy maybe was unaware of their occurrences

The starting point of this discussion was whether the theory that the Nicean Easter Rule reflects an attempt to avoid lunar eclipse on a Good Friday was justified or not. A reply requires dating of lunar eclipses acc. to the Julian calendar and to the Nicean Easter Rule. Sincerely Raoul Martens

From: Axel Harvey

The original poster wrote that he used Gregorian dates after 1582, which implies that he used Julian dates for earlier years. For what it's worth, the great canon on the Internet is Fred Espenak's eclipse site, <http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html>

In his notes Espenak specifies: "The Julian calendar is used for all dates up to 1582 Oct 04." Michael Gorodetsky's eclipse dates - the few I looked up - are the same as Espenak's.

> Checking also the other eclipses may probably give similar results. Hetherington's A Chronicle of Pre-Telescopic Astronomy at 45 BC, the Julian calendar starting year, says that "the year started in March"

Did the first year of the Julian reformed calendar begin in January or March (as far as the Romans were concerned)?

From: Jan Kalivoda

The Greek method for establishing the Easter Date can be called Dionysian for the Latin West, but not for the Greek East - this is a sort of politically incorrect "occidentalism" :) The method of Easter computus introduced to the West by Dionysius was created by Anatolius from Alexandria in cca 270 BC and from then onwards used in the East. Therefore it could be used 150 years before Dionysius, beyond any doubt.

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There was no Nicean Easter Rule - in the time of the Nicean Council at least. The rules of Anatolius were falsely attributed to the Nicean Council in the time of Leo the Great in cca 450. Jan Kalivoda

From: Michael L. Gorodetsky

RM> The dates for all eclipses presented seem to be Gregorian acc. to an eclipse program.

No, all the dates of eclipses before 1582 AD in my list are given in Julian calendar and dates of Easter before this year are calculated according to Dionysius (orthodox Easter). Eclipses after 1582AD are given in Gregorian calendar and Easter is calculated according to Gregorian rules. And I used of course modern methods of calculating eclipses and not the methods of Dionysius. And I seriously doubt that he even knew how to do this. If you are interested in eclipses on Orthodox Good Friday after Gregorian reform - there is also no problem to find them. If you like to know real history behind Easter calculations before Dionysius tables were commonly accepted, a very interesting book can be recommended - esse of Georges Declercq. "Anno Domini. The Origins of the Christian Era."

Large Sunspot Group

From: James Huddle To: SolareclipsesSENL200311aula.com Date: Wed, 22 Oct 2003 19:12:34

You can see a short video of that large sunspot group (#484) at <http://spaceweather.com/>. It is quite amazing: I was looking at it with my image-stabilized binox. I've never seen a sunspot group like it, but I hasten to admit that I am not a regular sunspot watcher.

The accompanying article mentions an X-class solar flare that "hurled" a coronal mass ejection out into space. That flare was not ejected toward Earth, which is good, because you can see it on the SOHO images. To check out the solar flare, see the latest SOHO images at <http://soho.nascom.nasa.gov>. From that home page, scan down the links on the left to "Latest Images" under the heading, "DATA". From the Latest Images page, look for "Real Time Movies," and choose your favorite format: Java, MPEG or Animated GIF. Jim huddle

From: Timo Karhula

When that huge sunspot is now easily visible to the naked eye (with proper filtration of course), I wonder how small sunspots can be seen without magnification? During the Mercury transit in May, I could barely see the largish sunspot near the middle of the solar disc. I could, however, not discern Mercury without optical aid. According to some photos where both the sunspot and Mercury appeared together, I measured the umbra's longer dimension to be about 25" when compared to Mercury's known diameter of 12".0. The penumbra made the spot larger but I doubt it accounted to the visibility.

By the way, the current solar activity created one of the 10 most beautiful aurorae that I have seen here in Sweden last Sunday evening (18.30 UT). The entire northern half of the sky were covered by moving, brilliant, green and red curtains and rays up to the zenith. Cheers, /Timo Karhula

From: Jay.M.PasachoffSENL200311williams.edu

The sunspot is good practice for June 8's transit of Venus, the first transit of Venus since the year 1882. Venus will be about 1 arcmin, making the transit equal to an annular eclipse with 0.1% coverage.

See photos of the 1882 transit and other information at <http://www.transitofvenus.info>. Jay Pasachoff

From: Gerard M Foley

An image is at <http://www.pbase.com/image/22563839>

This was made with a handheld Olympus C2100UZi camera at maximum zoom, with a Baader filter and a TCON17 tele auxiliary lens. The efl was 119 mm, equivalent to 640 mm on 35 mm film. Gerry

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From: Evan Zucker

Does anybody know how the current sunspot compares in apparent size to how Venus will appear in next year's transit? Since I may not be able to see the transit, I may have to make do with this sunspot.

I had my two young sons and wife take a look at the sun yesterday with a No. 14 welder's filter, and they all were able to see the sunspot. -- EVAN

From: Mark R. Kidger

It is generally reckoned that a sunspot is naked eye if it reaches 500 millionths of the area of the disk. Mark Kidger

From: Mark S. Margolis

Great looking sunspot today...dead center. If anyone has a pair of our Eclipse Shades, optical glass viewer or #14 welders...go take a look! Mark Rainbow Symphony, Inc.

From: Howard L. Cohen

Several people have sent messages about the large sunspot (no. 484) now on the Sun including the spot's relative size compared with Venus on the day of transit in 2004.

Although most people call this object a spot, it is, in fact, an extremely complex sunspot "group" rather than a single spot. The group may look like a single spot to the eye or when the resolution is poor (e.g., under low magnification, poor seeing, etc.).

However, when I viewed the "spot" today (2003 October 23) with a high quality refractor, one could easily see several large umbral spots surrounded by dozens (yes dozens) of small umbral spots all contained within a complex penumbral pattern. Indeed, the larger dark spots in the group are not exceptionally large but may appear so when they blend with their penumbral areas under poor resolution.

I measured the longest diameter of the spot group today as very close to 3.0 arc minutes. When compared with the current solar diameter, this makes the spot group about 130,000 km long, which is 90% of Jupiter's equatorial diameter.

Note: Other large spot groups have appeared in recent years. For example, the large sunspot group of 2001 March was about 1.7 times longer than the present group but was not as wide. The more rounded form of the current group helps give the current "spot" its huge, impressive appearance.

When Venus transits the Sun next June 8, the diameter of this planet will be 58 arc sec, or nearly one arc min. Therefore, the spot group (or "spot") is now about three times the width Venus will have at the time of transit. One arc sec is, in fact, roughly the size of the lead spot (umbra + penumbra) as seen today.

(I was also able to observe Venus during daytime today, some 17 degrees east of the Sun, showing a 10.4 arc sec disk. By the time of next year's transit, the diameter of Venus will grow nearly six times larger.)

It is notable that another very large spot group is now also visible (at the eastern limb of the Sun)! It will be interesting to see what develops with this new "spot" (no. 486). Meanwhile, sunspot 484 is nearly dead center in the solar disk and may be starting to break up.

All this excitement on a solar disk that only one week ago was nearly "spotless"! Let's hope people traveling to the November total solar eclipse will also have an interesting Sun to look at.

For those still thinking about observing the transit of Venus next year, I plan to escort a group to Crete. See:

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<http://www.flycapers.com/tours/voyages/2004/2004Transit/> Howard L. Cohen

From: Evan Zucker

Thanks very much for this precise information. It sounds as if Venus will not be especially evident to the naked eye next June (using a solar filter). I suspect that people with decent eyesight, like me, will be able to see it but only if they are specifically looking for it. The sunspot today was pretty easy for me to see, but it was still pretty small, and Venus will only be one-third that size. Of course, it will be somewhat darker than the sunspot, and its border will be much sharper. -- EVAN



From: Jay.M.Pasachoff@SENL200311williams.edu

It's best to see the giant sunspot group with your own eyes, but I don't recall seeing the various Web addresses for daily solar images posted in this SEML. I keep a current list at www.solarcorona.net/sun with the link at the bottom of the page.

**large sunspot gerard foley
22633970**

I like the Big Bear and Solar and Heliospheric Observatory sites especially. And we had to make do with them today, because it has snowed for two days! Jay Pasachoff

From: Evan Zucker

At 03:41 PM 10/23/2003, Howard wrote:

When Venus transits the Sun next June 8, the diameter of this planet will be 58 arc sec, or nearly one arc min.

According to an article that I happened to read today, "[t]he human eye can see detail down to one minute of arc" Can Aliens Find Us? http://story.news.yahoo.com/news?tmpl=story&cid=96&e=2&u=/space/20031023/sc_space/canaliensfindus

If that is correct, and if Howard is correct, then Venus will be just on the edge of naked eye visibility during its transit. -- EVAN

From: Mark R. Kidger

Is this really correct? The angular area of a circle with the radius of 900 seconds of arc (the Sun) is $\pi * 900 * 900 = 2.5$ million square arc seconds. An area $1 / 500$ millionths of that makes a circle with only $0".04$ 500 millionths $= 0.05\%$ 0.05% of the visible disc is $0".04$? Have you committed a small arithmetic error? Mark

From: Timo Karhula

You are absolutely correct. 500 millionths is far more than $1 / 500$ million! That corresponds to a circle with the diameter of 40" which is reasonable, but I saw the sunspot (without magnification) whose diameter was about 25" during the Mercury transit. /Timo

From: Mark R. Kidger

The number that I have given is the one used as a rule of thumb. Obviously some people will see smaller spots, but 25" is getting close to the absolute minimum that one can expect (i.e. not many people can see the phase of Venus with the naked eye, but a few can).

From: Timo Karhula

Is this really correct? The angular area of a circle with the radius of 900 seconds of arc (the Sun) is $\pi * 900 * 900 = 2.5$ million square arc seconds. An area $1 / 500$ millionths of that makes a circle with only $0".04$ in radius. That small a sunspot is certainly invisible to the naked eye! Mercury, whose diameter was $1/158$ of the Sun (or $1/25000$ of the area) could not be seen naked eye during the last transit. /Timo Karhula

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From: "Gerard M Foley"

Another image taken today is at

<http://upload.pbase.com/image/22605491>

I used the same equipment as for the earlier image. This shows the second large sunspot group emerging from the limb, and has been processed for higher contrast than the preceding image, which is still there. Gerry

From: Mick Wolf

I can not remain silent without commenting on some statements re smallest sunspot visible with the naked eye Mark Kidger's statement of 23-10-03 is perhaps a bit optimistic-40 sec. of arc dia., but his quotation caused some "funny" (peculiar) calculations.

<It is generally reckoned that a sunspot is naked eye if it reaches 500 millionths of the area of the disk.>

Timo Karhula asked if it is correct? Is this really correct? The angular area of a circle with the radius of 900 seconds of arc (the Sun) is $\pi * 900 * 900 = 2.5$ million square arc seconds. An area $1 / 500$ millionths of that makes a circle with only $0".04$ 500 millionths = 0.05% 0.05% of the visible disc is $0".04$? Have you committed a small arithmetic error? <

>You are absolutely correct. 500 millionths is far more than $1 / 500$ million! That corresponds to a circle with the diameter of $40"$ which is reasonable, but I saw the sunspot (without magnification) whose diameter was about $25"$ during the Mercury transit >Later on gives a correct answer - 40 sec. of arc.<

What puzzles me is why to get involved into some odd calculation when the answer is quite simple:: The human, standard, emmetropic eye has under lab conditions a resolution of 1min. of arc. Various people may differ only slightly. Some researchers in the past stated an increase in visus greater than 1 in American Indians (visus 1.2 - resolution of about 50 sec. of arc.) In practice however, to avoid strain, consider resolution to be in the order of 3 to 4 min..Light sources which are smaller than 1min. of arc are called point sources and they can be seen if bright enough, like the stars. So, even if you are on carrot diet, you will never observe Mercury transit with the naked eye and as far as Venus transit is concerned, you may see it or you may not. The answer is simple, if you want to observe a planetary transit - use a telescope. Mick Wolf,

From: Robert B Slobins

It is interesting to note that my wife and I were able to see a naked-eye sunspot for the first time (through filtration).

There have been other large sunspot groupings in the past and I tried to see them with no aid at sunset, in imitation of ancient Chinese astronomers who noted their appearance, and failed.

Note that spot #10484 is as big as Jupiter if the planet were at that distance. To me, the spot looked like a point, not a disk.

Therefore, I have doubts that I, or anyone else would be able to view transiting Venus with nothing other than a proper solar filter. cheers/rbs

From: Glenn Schneider

Mick is right, the measured median angular resolution of the human eye as an optic is indeed about an arc minute. What is also important to note also is that the space density of the photoreceptors in the retinal focal plane is well matched to that spatial resolution, and at about 5000 Angstroms (where we have are peak photometric response) the photopic sensors are spaced to essentially sample a point spread function of that width given the focal length of the human eye (isn't evolution a wonderful thing).

So it is not just resolution, but sampling. Our scotopic sensors (differentiating here between the "rods" and "cones") more sparsely populate the human retinal focal plane. They do undersample a 1-arcminute the Point Spread Function (i.e., the spread of energy from a point source at the focal plane due to diffraction and imperfect optics) of the human eye, only idealized with Gaussian response - for which the "Airy criterion" discussed later, is fully applicable. Of course most human eyes do not behave so well (e.g., I

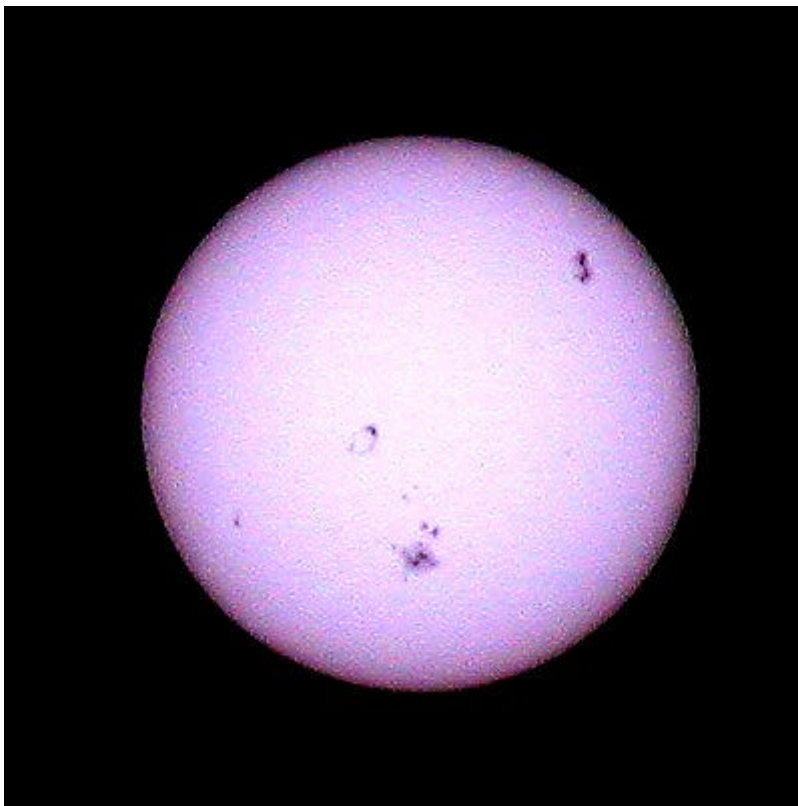
SETalk

have -3 diopters of spherical aberration in both my eyes, and a strong astigmatic aberration in my right eye) due to the limitations of the bio-optics, but many can be corrected to nearly so.

Our scotopic sensors, though have significantly more red sensitivity (6500 - 7000 Angstroms and perhaps longer for some individuals), very much more so after tens of minutes in the dark after secretion of rhodopsin in the eye has done its photochemical magic to stimulate and hypersensitize those sensors. So the undersampling for those wavelengths (critical sample spacing of sensors increases linearly with increasing wavelength) is not too bad.

(This is why I have always been such a big advocate of "dark adaptation" prior to viewing a TSE, and why I always wear an eye patch on one eye for a half hour before totality.)

To see what your PSF looks like with scotopic vision, in each eye of course, look at a bright red LED from across the distance of a fully dark room (to approximate a point source) after you are dark adapted. If you see a sharp point, you are among the lucky few blessed with good vision. If you're like me you will see lots of tendrils, and other "structures" radiating from the central blob. Sort of like the HST primary mirror before using corrective optics.



large sunspot gerard foley 2710 22712530

Another reason it is good to dark adapt (for observing a solar eclipse) is that your pupil (the aperture) will be fully dilated, and with a larger effective diameter (opening up the f/stop) all other things being equal (which they may not be) the resolution will increase linearly with the effective aperture size (see below). This too, of course, depends upon how aberrated your eyes are - and indeed you may get an improvement in resolution by "stopping down" (i.e. "squinting"). But all in all it is much better to use corrective augmentation (glasses or contacts) and use a fully dilated pupil.

Getting back to "resolution" though, the "classic" Airy resolution, which expresses the limiting angular distance between two point sources of the same intrinsic brightness, at which the point sources can be distinguished as separate objects is just $\text{angle(radians)} = 1.22 * \text{wavelength} / \text{aperture diameter}$ (in commensurate units, of course). What is often not said in Optics 101, is that this "Airy criterion" assumes:

- a point spread function which looks like a J2 Bessel function (Very close to a Gaussian in the core)
- only diffractive effects (not scattering)
- infinite contrast

The later is an issue which is often neglected. That it this assumes you have a ton of photons, so to speak, i.e. very large signal to noise against a virtually zero background. I.e., image contrast plays into *effective* resolution. This is compounded in the human eye because our adjacent photosensors are do not quite sample the input image in an independent manner, i.e., is there is some cross-coupling. No doubt nature intended some degree of redundancy as a hedge against some level of macular degeneration? I'm not an ophthalmologist, though, and I'll let the real experts speculate on that. A modulation transfer function for a high frequency signal with large image contrast will be better than one with small image contrast. Hence, if you are looking at a target which is not quite a point source, but has a "hard edge", it will be easier to resolve that edge than if it is "soft". I.e. two fuzzy sources very close to the resolution limit are harder to distinguish as two, than two uniformly black disks against a white background.

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How much will the atmosphere of Venus play into making its edge "soft" and lowering the contrast thus reducing the ability of those of us with less than optimal eyes to detect it unaided? That we shall see next June. But be sure, I'll augment my failing natural optical abilities - and be wearing my glasses.

"But I have two eyes, doesn't that help?", I am often asked. That is a matter of signal processing, and what your brain does with that independent information. Nature gave you two eyes so you could have binocular vision, and with the depth of vision that comes from your brain interpreting the parallax correctly, makes you an effective hunter to catch your prey. (Sorry if there are vegetarians on SEML, but this is indeed the case). Your brain is not "wired" to either process the signal as a "dithered" image to improve the spatial sampling limits of your photoreceptors, or - as I wish - as an interferometer. It would be great if we could do the later, and have a resolution (though with only a two-point baseline) of a combined appx. 70mm optic (the spacing between eyes) [and by tilting your head getting good "U/Vplane" coverage]. Well, I guess using a telescope will have to be an effective "workaround" for that lack of cerebral programming - at least for now. However, your brain DOES improve the signal to noise. Your brain actually does do that - and indeed you get a nearly (almost indistinguishable) squareroot(2) improvement in detective sensitivity with two eyes.

For those neurologists out there, I use the term "brain", actually, to mean the whole integrated system. Which parts are done in the analog hardware of the optic nerve itself, and which downstream in firmware, is not really the issue (and dodging the point as that is beyond my expertise - but happy to learn what others have to say. Just the net result, though, is what we need to understand for viewing planetary transits and TSEs. Glenn Schneider <http://nicmosis.as.arizona.edu:8000>

From: Jean Meeus

Now, at the last Mercury transit the planet's semidiameter was 6.02 arcseconds, while at the transit of June 2004 the semidiameter of Venus will be 29.11 arcseconds. So at that transit Venus' apparent area will be 23 times that of Mercury during its last transit. Therefore, I think that the Venus transit will be EASILY visible with the unaided eye.

Maybe RBS's eyes are not too good. I have seen many naked-eye sunspots in my life. Jean Meeus

From: Robert B Slobins

Jean: In daylight, the iris contracts. This reduces the eye's resolving power.

I mount a Baader solar filter film in front of a Tamron lens shade made for the 300 and 400 mm lenses I drag along to totality (Results---see the November 2003 Issue of Astronomy.) This covers up one's face and allows the eyes to open up.

Also, I never quite bothered to chase naked eye sunspots. (I did photograph them last year near to sunset with Velvia 50 film, f/64, 1/2000 - 1/500 second, no filtration no pentaprism on the Nikon F2 with a 2X teleconverter on the 400mm). But seeing two of them at the same time is interesting.

So you tell me that Venus will be about 1 arcsecond in diameter. Is that diameter at the limit of the eye's resolution, if not lower, and provided we have good seeing? cheers/rbs

From: Robert B Slobins

Glenn: Thank you for the clarification. And yes, I did mean arc-minute.

First, I do not think that I would be looking at the Venus transit except with optical aid. I intend to be using an H-alpha filter combo on one lens and white light with the other. I *may* use a ToUcam setup, although my first choice would be Velvia film or a digital camera.

The other point is that visual acuity is not the entire issue. One may correct vision to 20/20, or even overcorrect it to 20/15. This makes you believe that distant objects are closer to you and this is what helps the nearsighted make it in this world. Unfortunately, such correction may play havoc with one's visual perception, such as the accurate estimation and perception of distances and where

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things really are relative to where one is. So, correction to 20/25 or to minima allowed for driving, flying or other similar activities may be the best.

This has worked for me at eclipses. I may not see the eclipse perfectly under "naked eye" conditions. However, as I am usually busy managing a battery of equipment and working with my wife who is directing me through the tasks, I am better able to manage the workload better with undercorrection than with full correction.

So, I take responsibility for the fact that I do not go around the world fully corrected. Additionally, these two sunspots are Jupiter-sized. Somehow, I can not bring myself to believe that Venus will appear anywhere near that big on the solar disk. I guess that it will look like a dark point.

In this regard, has any record been found of a naked-eye Venus transit observation before 1639? The Chinese were pretty good at picking out sunspots without telescopes. cheers/rbs

From: Nicki Mennekens

There is no doubt that a Venus transit is visible with the unaided eye. However, a Mercury transit is obviously not (I don't know if it's almost visible, but that's fairly possible). The reason has been clearly given by Jean.

Sunspots are very much a border case: most aren't visible. I think it's only during a very active period (like now) that some sunspots are big enough. I must admit however, that I've never seen one with the naked eye (I haven't been trying much either).

But Venus will still be larger than the largest sunspots, so there should be no problem (except for the weather, like right now here in Belgium... :(). You can have a look at an animation of the 2004 transit on my site (http://users.telenet.be/nmenneke/eclips/engels/venus04_en.html), which clearly shows that Venus will be large enough. Greetings, Nicki

From: Glenn Schneider

I think you meant an arc MINUTE, Robert. See my post yesterday on resolution/detectability issues.

The bottom line is simply, with a diameter of an arc minute and (for those with imperfect eyesight) "fully" corrected vision, this is very close to the classical resolution limit. As a high contrast feature, it likely will be detectable by most (with a trained eye) - but this will depend very strongly on the characteristics of individual eyes.

Why not do a simple test?

Cut out a 150mm (appx 6") diameter circle out of white paper (to simulate the disk of the sun), put a 5mm (appx 1/5") diameter black dot on it (to simulate Venus), put that on a large black piece of cardboard (to simulate a dark background - as would be the case with a solar filter). Then stand it up and look at it face on from a distance of 17 meters (appx. 56 ft.) away.

Do you see the dot?

These proportions are right for the angular scales of the Venus transit. A distance of 17 meters (appx 56 ft.) is "far enough" away to be "at infinity" as far as human eyesight is concerned. You can double or triple everything if you want to better approximate "infinity".

If you want, view it through an orange filter to approximate the bandpass of a chromium solar filter, or a blue one for an aluminum filter, or green for welders glass etc.

That should tell you with a fair degree of reliability if YOU (with the specific characteristics of your eyes) will be able to see Venus transiting or not. Cheers, Glenn Schneider

From: Gerard M Foley

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From: "Nicki Mennekens" <nicki_mennekensSENL200311hotmail.com>

<http://www.pbase.com/gfoley9999/sun>

I estimate the trailing group to be about 2 arcminutes across, which I believe is about twice what Venus will be at the forthcoming transit. Gerry

From: Robert B Slobins

I want to caution anyone about using any drugs on your eyes. Oculists and some optometrists and ophthalmologists use atropin for examinations. They are trained in their use and can address adverse reactions.

As much as we urge the world about proper filtration when observing the sun, we ought not even mention the use, or abuse, of drugs on the eyes. cheers/rbs

From: Mick Wolf

My comments on the naked eye resolution caused quite a lot of replies. I must acknowledge the detailed article on visual perception of the human eye .

Some replies show some misconception other reservations. In order to make your own decision on the eye resolution try to make a practical test, as I did this morning (27-10-03). I cut an A5 matt black cardboard and covered one half with white paper. With a 2 hole punch a few "graffiti" like paper spots - 5.5 mm dia.

On the white sheet was placed a matt black spot and on the matt black cardboard were glued 3 white spots -1 spot was on its own, the other two were glued about 50 mm away with a separation equal to the spot diameter - 5.5mm.

The cardboard was stuck with a double sticky tape to a block of wood which was placed on a tripod. The sky was clear and the Sun elevation about 55 degrees. The width of the garden is 18m - lucky me - just the right distance for the test. $5.5/18000=0.0003055 = 1.05$ min of arc, the minimum distance for the experiment.

Here are some relevant data:

tan 1 deg. =0.01745

tan 1arcmin =0.00029088 1 part in 3437

tan 1arcsec.= 0.0000048486 1 part in 206200

Results:

- 1) Black spot was not resolved (visible) at 15,6m, which is equivalent to 72.7 arcsec.
- 2) Single white spot ceases to be an extended object, a point 1.05 arcmin
- 3) 2 white spots just appear to merge -1.05arcmin.

Try to do this test to confirm the resolution of the eye in practical terms One thing follows for black spot against bright background - the resolution drops - this applies to planetary transits. The contrast also the resolution. Dark adaptation or atropin drops might increase pupil to 8mm for 15 year old and 6mm for 75 year old. The increase in diameter of the pupil will increase the theoretical resolution, the spherical and chromatic aberration. Narrow bandwidth filters will help, but they are costly.

Variations of planet diameters

Mercury 4.7- 12.9 arcseconds

Venus 9.9 - 64 arcseconds

Jupiter 30.5 - 49.8 arcseconds

Mars 3.5 - 20.1 arcseconds

P.S. I just received Glen Schneider's e-mail describing a resolution test similar to mine, which I made this morning. He must be psychic . After reading all this, I am sure, you will use optical aids to view transits of planets Good luck and observing Mick Wolf.

From: Glenn Schneider

Mick Wolf wrote: What can I say, Mick, great minds think alike. The recent large flare event and CME must have disrupted the internet, as I sent that two days ago ;-) But, you didn't comment: Were YOU able to detect/resolve the black spot? With my glasses I could, without them, well, not a prayer. -GS-

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From: solareclipsewebpagesSENL200311btopenworld.com

Hi, For those whom want to measure the size of the sun, sunspots or granulae, please see our webpages http://solareclipsewebpages.users.btopenworld.com/SECalendar_files/PracticalExercises.PDF

where you will see Determination of the size of the sun, spots and granulae in a easy way. Enjoy,

From: KCStarguySENL200311aol.com

Jay Thanks for telling us about the 1882 eclipse. Wow only 0.1 coverage. Maybe I missed it but where will people be able to see it?
Dr. Eric Flescher (kcstarguySENL200311aol.com)

From: Nicki Mennekens

Yes, obviously a sunspot group is bigger than a single sunspot (and bigger than Venus). Maybe I didn't make myself clear. I compared Venus to a single sunspot as they are both circles (or dots), groups are not. By the way, it is difficult to compare a planet to a sunspot group, as the latter is not really black on bright, but has various degrees of contrast. Nicki

Seeing the eclipse with your eyes

From: KCStarguySENL200311aol.com To: SOLARECLIPSESENL200311aola.com Date: Wed, 29 Oct 2003 23:04:57

That was very interesting that the Prof said that. I am sure there are many in the scientific community who don't watch the eclipses at all for a variety of reasons but are busy with their equipment and research exploits. Many others watch with their cameras and don't see the marvel that seen by many eclipse people.

Like I said before, I have pictures of cars coming down the highway in Canada in 1979 with their lights on a few minutes before totality and was amazed that people did not stop to watch or know what was happening.

Eclipse chasers chase for a variety of reasons. I prefer to "drink in the beautiful sights" and marvel at these precious moments with my video and naked eye and photos.

I still marvel at my 1998, 1999 and 2001 videos and pictures. We'll await the progress of our friends who will have the opportunity to "drink in the sights" in November during the eclipse coming us. Dr. Eric Flescher (kcstarguySENL200311aol.com)

XVIII or XIX

From: Kelly Beatty To: SOLARECLIPSESENL200311AULA.COM Date: Wed, 29 Oct 2003 18:59:23

David... was this year's WSP the 18th or 19th? the cover of the program says the former, and inside it says the latter (for Lord Rosse's opening). also, are you in fact the Vice Chair of the Shannonside club? thanks, Kelly

Waldmeier

From: Jean Meeus To: "INTERNET:SOLARECLIPSESENL200311AULA.COM" <SOLARECLIPSESENL200311AULA.COM> Date: Thu, 30 Oct

Gerry, < Professor Waltmaier of Zurich who was then in charge of the Zurich sunspot number. > It is Waldmeier, not Walt maier!
Jean Meeus

From: Gerard M Foley Thanks, Jan. That should have worried me more than the Hochschule! I was too much in awe to ask him how he spelled his name. (:=) Gerry

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Visible corona at CME

From: Robert B Slobins To: "SOLARECLIPSESEN200311AULA.COM" <SOLARECLIPSESEN200311aula.com> Date: Tue, 28 Oct 2003 21:51:10

Dale: I believe that the only way one can detect motion in a CME visually during a total solar eclipse would be from comparing images across the entire track. If you notice the time stamps on the SOHO movies, the differences from frame to frame are quite large.

Now, if there is a 7-minute totality and there just happens to be a X17 flare just like what we have now with a velocity of >2000 km/second, you may be able to see differences in the coronal appearance from start to finish, but I doubt that you would see the plasma in motion. Regrettably, the sun did not accommodate us on 11 July 1991.

There have been recorded CME's before: drawn during the July 1860 totality, and one on 16 February 1980. I do not know if CME's were seen at other totalities. I would think that there would be some complex structures in the corona.

I have seen and photographed several eruptive prominences this maximum. They just do not *MOVE*. They do change their appearance--but the process takes about 45 minutes from start to finish. So it is a quite leisurely pace from this distance, unless one is busy running film (and in some instances, fending off cats that want to rub against the tripod). It takes a mental leap to understand that this motion equals that of a Leonid meteor: 70 miles/second--112 km/second. This is a velocity that would make it to the moon in 60 minutes. (This CME is moving twice as fast as this.)

I would welcome anyone on this forum to check my math and facts.

Anyway, the CME's ETA for you in Washington is midnight. I hope you have no early appointments tomorrow morning! ;-)
cheers/rbs

From: Robert B Slobins

Glenn: Cary Oler estimates that this X17 flare is moving >2100 km/sec. That is extremely fast. One will have to be VERY lucky to catch something like this during totality. Most X-class flares move at half that rate and I doubt that anyone would notice, at least naked-eye.

Tell me something: just how many among us would notice coronal motion with everything else that happens during totality?

Now, this brings up 1919. The 29 May 1919 total solar eclipse, which provided the means to prove Einstein's theory of relativity, was also notable for one of the biggest prominences ever observed. I have seen some copies of the images in books; it would be interesting to get a hold of these plates and see what they look like.

Totality was nearly 7 minutes. That would give enough time to see prominence motion. cheers/rbs

From: Dale Ireland

Hi Jay et al If there was a large Coronal Mass Ejection at the time of a total eclipse would it appear visually during totality like the time-lapse Coronal Mass Ejection movies we are seeing today from SOHO? Are those in the visible part of the spectrum? Would there be huge visible lumps in the corona? Do you think motion might be visible in the few minutes of totality? Dale Ireland

From: Jay.M.PasachoffSEN200311williams.edu

At the 1980 eclipse, there was a big coronal mass ejection that was seen to move between the time it was seen from Africa and the time it was seen from India. There are photos in Sky & Telescope at the time (you can find old copies or search the Web) that showed the difference, as I recall. We can hope for one like that or like today's during an eclipse, but you wouldn't see any motion at your own location. It takes order of an hour to grow appreciably. I don't think motion would be visible in a few minutes. And aside from such a CME, motion is not visible in the corona. Serge Koutchmy from Paris set up a big program in 1991 to set up

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identical cameras widely separated, and even that didn't detect motions. Jay Pasachoff

From: Glenn Schneider

Dale, I certainly will defer to Jay on details, but note the time stamps on the CME movie: http://sohowww.nascom.nasa.gov/hotshots/2003_10_28/c2cme.mpg The pre-event frame is 11:06, the next frame which captures the ejection in the mid/outer corona (the white circle is the disk of the Sun*) is only 24 minutes later, and the subsequent frame where it is largely out of the FOV is again 24 minutes after that. With this rate of motion, in a 2m eclipse (or ~ 2-1/2 minute from the QANTAS of Lan Chile flights) you certainly could detect such motion readily.

That image is taken with the LASCO C2 coronagraph. C2 works in visible pass bands, see: http://lasco-www.nrl.navy.mil/filter/c2_all.gif I don't know which filter was used for this "movie" but to answer your question - definitely in the visible.

But still a question for Jay: What is the nature of the radially more-or-less circumsolar isotropic feature which seems to have been excited by this event as seen in the 11:24 UT frame?

* See: http://sohowww.nascom.nasa.gov/hotshots/2003_10_28/C2_EIT.tif -GS-

0.1% annular eclipse = transit of Venus

From: Jay.M.Pasachoff@SENL200311williams.edu To: solareclipses@SENL200311aula.com Date: Tue, 28 Oct 2003 18:21:16

On June 8, 2004, the next transit of Venus since the 1882 one will occur, with the 0.1% obscuration. The end of the six-hour event (a 6 hour annular eclipse!) will be visible in the eastern US. Central Europe and Asia will see both ingress and egress. The western US won't see this event at all. Fred Espenak did maps for the 2004 and 2012 transits of Venus, and they are linked from our site at www.transitofvenus.info. Jay

CME Information/Predictions

From: Glenn Schneider To: SOLARECLIPSE@SENL200311AULA.COM Date: Wed, 29 Oct 2003 05:27:31

The following was forwarded from Dan McKenna:

Type II: 1250 km/sec Estimated LASCO-derived Plane of Sky Velocity: 2125 km/sec

ESTIMATED TIME OF ARRIVAL OF SHOCK AT EARTH

Estimated Impact Window: 00:00 UTC on 29 October to 21:00 UTC on 29 October
Preferred Predicted Impact Time: 08:00 UTC, 29 October 2003 (3 am EST on 29 October)
Estimated Shock Strength (0=Weakest, 9=Strongest): 9

Predicted Behavior of IMF at Shock Impact

At Shock Impact, the Interplanetary Magnetic Field is predicted to initially turn: SOUTHWARD

IMPORTANT TIME OF ARRIVAL NOTICE FOR NORTH AMERICANS

The preferred time of arrival is *****TONIGHT*****, TUESDAY NIGHT
(before you go to bed that night) near or after 3 am Eastern Standard Time).
That's 2 am Central Standard Time on TONIGHT.
That's 1 am Mountain Standard Time on TONIGHT.
That's MIDNIGHT Pacific Standard Time on TONIGHT.



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EXPECT RESIDUAL ACTIVITY (LESS INTENSE) TOMMORROW NIGHT (WEDNESDAY, 29 OCT) AS WELL !

EVENT #49 NOTES:

This is the most energetic Earthward-directed event of the solar cycle.

SEVERE to MAJOR geomagnetic storming is expected to abruptly commence following the arrival of the shock front from this flare.

This flare was associated with a Ground-Level Event. It was also associated with very high energy protons at greater than 100 MeV (which are still climbing, over 5 hours after the event began). A magnetic crochet was observed over the daylit sections of the ionosphere. An exceptionally intense shortwave fadeout and polar cap absorption event are in progress. There are reports this event was observed in white-light. Intense radio bursts were associated with this event across the spectrum. The type II shock velocity is not representative of the observed velocity of this CME. The observed velocity as determined by SOHO was 2125 km/sec.

This event has the potential to produce the strongest geomagnetic storm since 1989. Auroral activity could become visible into the deep low latitude regions. This one is worth driving a good long distance over to find clear skies. It has better potential to produce low-latitude aurora than almost any other event observed in the past decade. Keep in mind that it is also possible the disturbance may not be nearly as geoeffective as many would like. It all depends on the character of the magnetic fields imbedded within the coronal mass ejection. However, we believe it will either be very large, or only modestly large in terms of its capacity to produce disturbed geomagnetic and auroral activity. We do not expect this disturbance to be small.

These predictions may be based on preliminary data and may be revised without warning. The predictions should not be used as a definitive indication of CME impact times or strengths and may frequently be in error. The proprietary methods used to estimate shock impact times are under continual development. Caution is advised.

From: Dale Ireland

Just watched the biggest Aurora I have ever seen, west of Seattle. 3am PST, red and green streamers over the entire northern sky. Waves of brightness rolled through the pillars from the north horizon up to the zenith in less than 1/2 second, more like flashes. I got some photos but will not have them developed until Wednesday afternoon. Really amazing. Dale

More Eclipse images

From: F.Podmore To: Solar Eclipses Mailing List <solareclipsesSENL200311@ula.com> Date: Sat, 01 Nov 2003 14:16:57

While looking at some of the amazing images of recent auroral activity, on www.spaceweather.com and click on GALLERY, also www.spacew.com,

I came across the website of Russell Cockman, originally from Australia but now living in Scotland. His website

www.russellc.pwp.blueyonder.co.uk

has a link to his splendid Eclipse (solar and lunar) images. I'm posting this for those on SEML who are collecting and archiving eclipse images available on the web (Jay, Sheridan....) Bye, and good luck for those travelling to the deep south for 23Nov. Francis



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SEVERE AURORA STORM ALERT TONIGHT FOR USA

From: klipsiSENL200311bluewin.ch To: SOLARECLIPSESENL200311AULA.COM Date: Tue, 28 Oct 2003 17:27:46

<http://www.spacew.com/cme/index.html>

could be best aurora storm since 1989 !!! Klipsi

From: Michael Gill

In the midst of all this interesting solar activity it is worth remembering that we are now approximately one solar rotation (26-days at the solar equator) away from the November TSE.

The latest coronal image from the HAO Mauna Loa is here:

http://umbra.nascom.nasa.gov/images/latest_mk4.gif

Active Region 0484 is now getting closer to the solar limb. Hopefully, this region will hang about as it passes around the far side of the Sun. Or be replaced by something just as big, situated close to the solar limb on November 23rd.

With luck, perhaps we'll get some interesting limb activity in the chromosphere on eclipse day. Cheers, Michael Gill

From: Robert B Slobins

Mike: Let me chime in: If you are flying above 40K feet/10K meters through the auroral oval right now, you will get the equivalent of a chest x-ray.

An S-4 gives you 10 chest x-rays, and an S-5, 100. See www.spaceweather.com and associated links describing the classes of solar radiation phenomena.

Air travel will not kill you. Indeed, there are places that have natural radiation: near Cumberland, RI, the New Jersey hill country, Spruce Pine, NC that would give you a higher dose.

By the way, speaking of fast-moving limb phenomena, I observed a flare on or behind the SW solar limb from 1628-39 UTC. The flare reached .2 - .3 solar radii before its dispersal. So yes, if there were a total solar eclipse at that moment, one would easily record the changes in the prominence's/flare's form. cheers/rbs

From: Jay.M.PasachoffSENL200311williams.edu

At mid-latitudes, we are well shielded from the magnetic storm, but in our high-flying airplane we won't be so safe. I wonder how much radiation people would pick up flying at 40,000 feet on our flight path if the eclipse were today?

THE FOLLOWING RELEASE WAS RECEIVED FROM THE HARVARD-SMITHSONIAN CENTER FOR ASTROPHYSICS, IN CAMBRIDGE, MASSACHUSETTS, AND IS FORWARDED FOR YOUR INFORMATION. (FORWARDING DOES NOT IMPLY ENDORSEMENT BY THE AMERICAN ASTRONOMICAL SOCIETY.) Steve Maran, American Astronomical Society

CfA Release No.: 03-23 For Immediate Release: Oct. 30, 2003

Contacts: David Aguilar 617-495-7462 daguilar@cfah.harvard.edu

Christine Lafon 617-495-7463 clafon@cfah.harvard.edu

NOTE TO EDITORS: A high-resolution image and movie will be posted online at <http://cfa-www.harvard.edu/press/pr0323image.html>

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WE'RE GOING TO GET HIT AGAIN!

Cambridge, MA- Just when we thought we were through the worst of it, a second gigantic solar flare has erupted, sending another coronal mass ejection directly towards Earth. The X10-class flare was detected by an orbiting GOES satellite at 3:37 p.m. EST on Wednesday, Oct. 29th and peaked at 3:49 p.m., according to the National Oceanic and Atmospheric Administration.

"It's like the Earth is looking right down the barrel of a giant gun pointed at us by the Sun...and it's taken two big shots at us," says John Kohl, a solar astrophysicist at the Harvard-Smithsonian Center for Astrophysics (CfA) and principal investigator for the Ultraviolet Coronagraph Spectrometer on board NASA's Solar and Heliospheric Observatory (SOHO) spacecraft.

"The Sun is really churned up. The timing of two very large X-class flares aimed directly at the Earth, occurring one right after another, is unprecedented," says Kohl. "I have not seen anything like it in my entire career as a solar physicist. The probability of this happening is so low that it is a statistical anomaly."

As the faster moving particles from the second eruption catch up to the slower moving particles from the first eruption - the combined effects cannot be predicted. Kohl states, "This second blast is moving like a fast freight train that very soon will plow into the back of the slower moving freight train in front of it just as it pulls into the station. The station, in this case, happens to be the planet Earth."

The two eruptions may create a combined geomagnetic storm that could influence the Earth in a number of ways, including disrupting satellite communications and power grids. However, precautions have already been taken to minimize the potential impact. For example, power companies have reduced the line loads to allow leeway for possible surges.

People on the ground are well protected from the ongoing geomagnetic storm due to the Earth's natural shielding. Pacemakers and similar devices are not affected. Airline travel also is safe, since the Earth's magnetosphere and atmosphere block the solar radiation. The web site space.com reports that the astronauts aboard the International Space Station are taking the precaution of staying in the most shielded areas of the station during these periods of high solar activity.

A solar flare is a magnetic storm on the sun. It appears as a very bright spot, and blurps gas from the Sun's surface into space. Solar flares are classified based upon their x-ray energy output at peak burst intensity. Solar flares generally don't have much of an effect on our world.

A coronal mass ejection (CME), by contrast, can affect the Earth dramatically. A CME is a huge eruption from the Sun that blasts a billion tons of highly charged particles into space at speeds greater than a million miles per hour. When those charged particles reach the Earth, they can damage orbiting satellites. The particles also interact with the Earth's magnetosphere to create spectacular auroras known as the Northern and Southern Lights.

Solar flares and coronal mass ejections often occur together like touchdowns and field goals in football games. Astronomers see the X-rays from the solar flare first because they travel at the speed of light. Then, the slower-moving (although still blazingly fast) high-energy protons from the CME reach the Earth, and that's when the fireworks begin!

"We thought we were getting through this first major solar event relatively untouched," muses Kohl, "but now it's turned into a cliffhanger. Part two is yet to come!"

Headquartered in Cambridge, Mass., the Harvard-Smithsonian Center for Astrophysics is a joint collaboration between the Smithsonian Astrophysical Observatory and the Harvard College Observatory. CfA scientists, organized into six research divisions, study the origin, evolution and ultimate fate of the universe.

From: Mike Simmons

Jay, I caught your nice live interview on our local station KPFK while at work yesterday. Just after you were interviewed, David Aguilar of CfA (the contact for the press release you posted) was also interviewed. This was just after the latest flare was noticed and he proclaimed air travel safe despite the flares. Do you think otherwise? Mike Simmons

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From: Jay.M.PasachoffSENL200311williams.edu

"Safe" has a variety of meanings. There is a Web site I got yesterday, I think through spaceweather.com though I can't find it there at the moment, linking types of flares with human exposures: 1 chest x-ray, 100 chest x-rays, etc. And "safe" at mid-latitudes of the US is different from the exposure near the south magnetic pole. So I just don't know how much worse it would be on our flight path near the south magnetic pole. Would I accept the radiation of 100 chest x-rays to see a total eclipse. I think so.

From: Glenn Schneider

Jay.M.PasachoffSENL200311williams.edu wrote: At mid-latitudes, we are well shielded from the magnetic storm, but in our high-flying airplane we won't be so safe. I wonder how much radiation people would pick up flying at 40,000 feet on our flight path if the eclipse were today?

Jay raises an interesting question.

Charged particles, of course, travel on helical paths along geomagnetic field lines and "mirror" back and forth between the northern and southern hemispheres. It is the presence of the field that "shields" us at non-polar latitudes (SAA excepted) from high energy charged particles which can assail the earth, being kept at "high altitude" as they whisk overhead (so to speak). At any instant of time, however the magnetospheric field lines hit the surface of the Earth at "conjugate" locations in the northern and southern polar regions (i.e., where they "open up" at the magneto-cusps; picture in too-simple terms a dipole field). Where that is on the Earth depends on the time of day as the Earth rotates since the rotation axis is inclined w.r.t. the magnetic axis, and the "dipole" is offset from the geocenter. The southern magnetocusp predictably passes the South Pole once a day as it makes its cyclical path over/across the Antarctic (at other times at higher latitudes). The conjugate point to the South Pole in the northern hemisphere is near Thule, Greenland. This is why there have been cosmic ray research facilities located at these two "mirror" sites - as particle showers can occur there (at the same time) once a day. I don't know off hand where the southern magnetocusp will be w.r.t. the time and position of either eclipse-chasing aircraft - perhaps someone here might (I'll check that out if there are no replies). I will say that during the two seasons I worked at the South Pole, I didn't particularly worry about high energy particle exposure - but then, the Sun wasn't going through the gyrations it has been of late. If I have a few extra kilos in my baggage allowance, maybe I'll pack my lead underwear. ;-)-GS-

From: Nicki Mennekens

Affirmative. At 40,000 feet passengers will suffer a lot of radiation. This is not really dangerous (when you are X-rayed, you also undergo some radiation) and so it isn't necessary to panic and cancel your flight, but if possible it is to be avoided. Nicki

From: Jay.M.PasachoffSENL200311williams.edu

Further to my earlier message about radiation exposures, I found

<http://www.lund.irf.se/HeliosHome/spaceagencyLSWFS.html>

listing Solar Radiation Storms

(NOAA Space Weather Scales)

Extreme PE (105pfu, 10 MeV): Unavoidable high radiation hazard to astronauts on extra-vehicular activity (EVA). High radiation level to passengers and crew in commercial jets at high latitudes (100 chest x-rays).

* Severe (104pfu): Unavoidable radiation hazard to astronauts on EVA. Elevated radiation exposure to passengers and crew in commercial jets at high latitudes (10 chest x-rays).

* Strong (103pfu): Radiation hazard avoidance recommended for astronauts on EVA. Passengers and crew in commercial jets at high latitudes receive low-level radiation (approx. 1 chest x-rays).

* Moderate (102pfu): No biological effects.

* Minor (101pfu): No biological effects.



SETalk

From: Klipsi

and now, the real eclipse chaser's question : what about my film ??? alright, we all get x-rayed in our Qantas flight and we are willing to accept it (you only live twice, right?), but ... what about my eclipse photos , will they get x-rayed and blurred from those strong solar storms ? Now THAT would be quite a weird thing ! There we go, flying high to see the solar eclipse, and the SUN in person destroys our films . isn't THAT amazing ! Go figure ! Klipsi

From: Dale Ireland

Hello When passengers at 40,000 feet are getting the equivalent of 10 or 100 chest x-rays (I think a chest x-rays is 10rems) people on the surface must be getting something. I am no atmospheric expert but it seems hard to believe you could get 100-1000 rems at 40,000ft and zero at the surface. I wonder why no values for the surface are indicated. Some common doses are here <http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/R/Radiation.html> Dale

From: Dale Ireland

my last post should have been mrem's millirems, not rems, sorry

From: Jen Winter - ICSTARS Astronomy

For a visual demonstration of this effect, I invite everyone to view the current Solar imagery from the SOHO Satellite. <http://www.n3kl.org/sun/index.html>

You will note that the Japanese Yohkoh Soft X-Ray image is DOWN, The 28.4nm image is not just spattered with burnt pixels, but the entire image is scrambled: http://umbra.nascom.nasa.gov/eit/images/latest_eit_284.gif

I don't think it's the solar storms which are giving Big Bear their problems... those may just be ground/fire -based.

- We did, however, catch some serious Mid-latitude aurora activity last night right after sunset here in the midwest. We have images posted on the web linked off the front page at: <http://icstars.com/>

If these activity levels keep up, we may just have to all look for Aurora Australis during Totality! jen Winter - Owner

From: Dale Ireland

Hi I wonder if you get more radiation flying at 40,000ft over the earth's magnetic poles than normally. Dale

From: Glenn Schneider

Jen (et al),

> The 28.4nm image is not just spattered with burnt pixels,

This description sent shivers down my spine (wearing my hat as an instrument scientist - which is what I do when not chasing eclipses). They are not "burnt pixels", just cosmic ray hits on the detector. We get them all the time in space, of course MANY more during these sort of events - but no long term effects at all. The charge goes away when the detector is read out and/or reset.

> but the entire image is scrambled: http://umbra.nascom.nasa.gov/eit/images/latest_eit_284.gif

I didn't see any "scrambling" - is this really the right URL? Cheers, -GS-

From: Howard L. Cohen



SETalk

The 2003/10/30 16:21 EIT 28.4 nm image, which is no longer the "latest," may be the "scrambled" image referred to by Jen.

http://150.144.30.101/data/realtime/javagif/gifs_small/20031030_1621_eit_284.gif Howard Cohen

From: eclipseclatSENL200311comcast.net

Regarding the South Magnetic Pole here are some notes I made a few years ago:

Wednesday, January 31, 2001 Magnetic north pole: visit by team May 10 2000 79D 19M North, 105D 26M West This geographic North Pole does not coincide with the magnetic North Pole--to which magnetic compasses point and which in 1993 lay west of Ellef Ringnes Island, in the Queen Elizabeth Islands of extreme northern Canada (at about 78°27' N, 104°24' W)--or with the geomagnetic North Pole, the northern end of the Earth's geomagnetic field (about 79°13' N, 71°16' W). The geographic pole, located at a point where the ocean is 13,410 feet (4,087 m) deep

South Pole southern end of the Earth's axis, lying in Antarctica, about 300 miles (480 km) south of the Ross Ice Shelf. This geographic South Pole does not coincide with the magnetic South Pole, from which magnetic compasses point and which lies on the Adélie Coast (at about 66°00' S, 139°06' E; the magnetic pole moves about 8 miles [13 km] to the northwest each year). Nor does it coincide with the geomagnetic South Pole, the southern end of the Earth's geomagnetic field (this pole also moves; during the early 1990s it was located about 79°13' S, 108°44' E). The geographic pole, at an elevation of some 9,300 feet (2,830 m; the elevation also changes constantly) above sea level, has six months of complete daylight and six months of total darkness each year. Ice thickness is 8,850 feet (2,700 m).

So there are three north poles and three south poles. Four if you include the polar star north sometimes shown on maps. The dipole constant is a constant equal to the field strength times the distance from the center. This mathematically defines the axis of the dipole so the north & south geomagnetic poles are directly opposite each other by definition (over a long distance outward from the Earth) but the magnetic poles are not directly opposite. The magnetic poles are where the lines of the field are perpendicular to the surface of the Earth due to local effects. So simply draw a normal field pattern then tilt some of the lines so they are normal to the surface not at the dipole axis.

The location where the compass needle is perpendicular to a line of force is closer to the geographic equator. So the magnetic (compass) north is farther from the geographic north pole than the geomagnetic north pole. Same is true for the south pole. Yes the Britannica was right Compass north pole closer to equator?

If you needed to label the top of the Earth like a kid's toy magnet, it would have an S on it since the compass north needle points to other compass south ends.

Recent note: Feb 2002 NGS Map of Antarctica shows South magnetic Pole now migrated to -65.0 deg S, 139 E. This is 1500 miles from the intercept point for the Croydon flight. Perhaps I can obtain some dosimetry from one of my nuclear sites to measure our dose during the flight. Raymond Brooks

Total Lunar Eclipse 8-9/11/2003 - Live webcam from Gran Canaria

From: Francisco A. Rodriguez Ramirez To: lista eclipse
<SOLARECLIPSESENL200311AULA.COM> Date: Mon, 03 Nov 2003 19:43:06

Dear friends, SAROS Group Scientific Expeditions will broadcast the next total lunar eclipse from an astronomical observatory in "Melia Tamarindos Hotel" in Gran Canaria (Canary Islands). URL: <http://live.saros.org> Best Regards Francisco A. Rodriguez Ramirez www.astroeduca.com www.saros.org



SETalk

Where is Sun's spin axis?

From: F.Podmore To: Solar Eclipses Mailing List <solareclipsesSENL200311@ula.com> Date: Thu, 30 Oct 2003 16:23:20

I hope this isn't a dumb question:

If I am watching the Sun rise, say tomorrow, from Harare (latitude 18 degrees south), what is the direction of the Sun's spin axis relative to my horizon? Is the Sun's north pole to my left? And which way will I see the Sun rotating? Is there a diagram somewhere on the web that will show me? (Sorry, that's four questions!). Thanks, Francis

From: Dale Ireland

Hi There is a table on Fred's site with the Position angle and "tilt" of the Sun for the year <http://sunearth.gsfc.nasa.gov/eclipse/TYPE/sun2.html#su2003> The Sun's rotation axis is tilted 7.5 degrees to the Earth's orbit and the north pole points toward us in late September, so with north up in late October the Sun's north pole is still towards earth but to the "left" of a line going to the earth's celestial pole. Dale

From: Klipsi

> I hope this isn't a dumb question:

nope. there is no such thing as a dumb question. The fact that you ask a question puts you out of the dumb zone ;-)

> If I am watching the Sun rise, say tomorrow, from Harare (latitude 18 degrees south), what is the direction of the Sun's spin axis relative to my horizon?

almost parallel, I would say.

> Is the Sun's north pole to my left?

yes, I would say so

> And which way will I see the Sun rotating?

from bottom up

> Is there a diagram somewhere on the web that will show me?

maybe there is. If not, maybe this can help : check out the position of the sunspots at http://150.144.30.101/data/realtime/realtime-mdi_igr.html and then compare them to what YOU see. The difference involves the axis. Klipsi

From: Gerard M Foley

When I posted the images of the sun at <http://www.pbase.com/gfoley9999/sun> a friend suggested that I rotate them to put the axis vertical, and gave me a reference to SOHO that he thought would help with the orientation. I couldn't trust myself to rotate the images correctly.

When I look at my pictures during totality in a TSE, I think I know that the poles of the Sun are the places the rays spread out from, but I'm not sure even then if I'm correct. The magnetic poles of the earth are certainly not very imply related to the geographic ones. Gerry

From: eclipseclatSENL200311@comcast.net

Guy Ottewell's yearly books show the Sun's orientation month to month. Ray Brooks



SETalk

Aurora images

From: F.Podmore To: Solar Eclipses Mailing List <solareclipsesSENL200311aula.com> Date: Sat, 01 Nov 2003 13:57:05

Perhaps members would like to see some of the fantastic aurora images from the Sun's recent violent outbursts - www.spacew.com and www.spaceweather.com are compiling galleries of them. Bye, Francis

From: F.Podmore

More aurora to watch for. Francis

Forwarded message - Date: Sun, 2 Nov 2003 16:55:37 -0600 From: SpaceWeather.com <swlistSENL200311spaceweather.com> To: SpaceWeather.com <swlistSENL200311spaceweather.com> Subject: Here Comes the Sun

Space Weather News for Nov. 2, 2003 <http://spaceweather.com>

Another remarkable solar flare has erupted from giant sunspot 486--an X8-class blast at 1725 UT on Nov. 2nd. Because the sunspot is nearing the sun's western limb, this explosion was not aimed squarely at Earth. Even so, a coronal mass ejection (CME) is heading our way. Auroras could appear on Nov. 3rd or 4th when the fast-moving cloud delivers a glancing blow to Earth's magnetic field. Visit spaceweather.com for more information and images.

You are currently subscribed to spaceweather as: podmoreSENL200311science.uz.ac.zw To unsubscribe send a blank email to leave-spaceweather-522897RSENL200311snglist.msfc.nasa.gov

Evan Zuckers home

From: Evan Zucker To: SOLARECLIPSESENL200311AULA.COM Date: Sun, 02 Nov 2003 09:21:41

During the terrible southern California fires this past week, the sun has frequently been heavily dimmed by the smoke. My sons and I readily observed at least one of the sunspot groups with our naked eyes without the use of any filter. My 10-year-old son says he was able to see two of the groups.

On the negative side, my home and home office were completely destroyed by the Cedar fire in San Diego last Sunday. I had complete computer backup tapes in a fireproof box that was specifically designed to protect magnetic media, but the box and the tapes were completely destroyed as well. Unfortunately, I was not at home when the fire occurred Sunday morning -- I was at Edwards Air Force Base with my son for the annual open house and air show -- and so I was not able to take my laptop computer, backup tapes, or many thousands of photographs. My wife was home alone with my 6-year-old son. She received no advance warning of the fire and was forced to evacuate with only a few pieces of children's clothing. Evan Zucker San Diego, California

From: Sheridan Williams

I hope Patrick won't mind me posting this email on the eclipse web site.

I was truly shocked to hear of Evan Zucker's loss of his family home and all its contents. I'm sure others will join me in sending our sincere condolences. Our family house and contents were destroyed in a fire when I was a teenager, so I can sympathise totally, it will be absolutely traumatic for him and his family.

From: Evan Zucker

Thanks to all who have sent me their good wishes on the SEML and privately.

I put together a quick and dirty web album of some photos I took yesterday in and around what's left of my house. You can view

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them at: <http://adobe.shutterstock.com/osi.jsp?i=67b0de21b35744554554>

I'll try to add some meaningful captions later in the week. -- EVAN

From: Glenn Schneider

Evan, et al., Sorry to break protocol Patrick, but we managed to escape the Mt. Lemmon fire this summer by a very slim and nerve wracking margin and cannot begin to imagine otherwise if we had not been so lucky. There is little we can do but offer our sincere empathy for you losses and our best wishes as you try to pick up the pieces left and go forward. We eclipse chasers are a small community, and many here likely have crossed paths (of totality or other) with Evan at some juncture. It's a very small thing, perhaps collectively we might scan through our eclipse related (and other) photographs and send copies of memories we may have shared. I am relieved to hear that your family came through all right, but I am so sorry for the loss of your home. With best wishes for the future, Glenn Schneider

Venus Transit Visibility

From: eclipseclatSENL200311comcast.net To: SOLARECLIPSESENL200311aula.com Date: Mon, 03 Nov 2003 03:32:39

Regarding last week's prognostication whether the Venus transit would be visible at 1.0 magnification (simple filter placed in front of the eye). My expectation is that it will be quite apparent for most people.

Is comparing it to similar sized sunspots on purely a dimension basis fair? Sunspots are approx 8000F versus 10,000F for the photosphere. Since radiative power is a function of T to the fourth power, Venus (700F) would appear 17,000 times darker than a similar sized sunspot. Venus is basically black versus a sunspot. The human eye is so dynamic that I expect it to be quite obvious for most people.

On the other hand, there are likely other factors which reduce the brightness of sunspots. Sunspots do not seem 40% as bright as the photosphere to me, they seem darker than that. So Venus might be harder to see than I am predicting. We will find out soon. Raymond Brooks

From: James Huddle

A common error that does not make too much difference here: Power does go as the fourth power of temperature, but you have to use an absolute temperature scale, one that has zero degrees at the absolute zero of temperature. 8000 F = 4700 Kelvins, and 10000 F = 5810 Kelvins, so the intensity ratio is more like $(4700/5810)^4 = 43\%$. Like I said, it doesn't make a big difference in this case. Jim Huddle

From: Jean Meeus

Is a transit of Venus across the solar disk visible without optical aid?

In Vol. 3 of the MNRAS (p. 276 ff) there is a report by Maures Horner about the transit of 1882 December 6. He wrote: "The planet's disk was easily seen by the unassisted eye, and indeed without any protection by some young retinas when the Sun was near setting".

Well, this is clear! (Thanks to Felix Verbelen, Belgium, who sent me that information). Jean Meeus

From: Felix Verbelen

The correct MNRAS volume number is 43 (not 3). - sorry for that. Regards. Felix Verbelen

From: eclipseclatSENL200311comcast.net

Dear Jim; Of course..I need to get more sleep. But still a ratio of 6600 to one, so Venus is much darker. Well, Jean Meeus put this

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to bed (pun intended) with his recent email on easy visibility in the Dec 1862 report. Ray Brooks

From: Glenn Schneider

I call to your attention an earlier published account of a naked eye observation of a Venus transit - that of 1769. From Philosophical Transactions (1683-1755) Vol 59, pp 247-252, Samuel Holland Writes:

"Mr. St. Germain, of the seminary of Quebec, observed the same {ingress} contact, at the same instant {2h 28m 1.5s} with Short's 2 feet reflecting telescope. Clouds, intervening, prevented the observation of the first internal contact: BUT AT 6 O'CLOCK THE PLANET MIGHT BE SEEN WITH THE NAKED EYE ON THE SUNS'S DISK, THROUGH THE HAZINESS OF THE ATMOSPHERE."

While speculative in MNRAS, XLII, 43 (1882) the Rev. S. J. Johnson, M.A. writes on "The Probable Assyrian Transit of Venus" as follows:

"...There is, however, one instance in very ancient times which may turn out to be a transit. A broken Assyrian tablet, just mentioned in a note by Rev. Mr. Sayce in "Nature" some years back, may perhaps deserve more attention than it received. As the tablet is concerned with the planet Venus, and the following succession of broken lines occurred: "the planet Venus" -- "it passes across" -- "the Sun" -- "across the face of the Sun" it naturally occurs to try to try to fill up each hiatus. But it seems very difficult to explain the last sentence otherwise than supposing an actual transit is recorded, which, it seems, must be before the sixteenth century B.C. It reads like a case of an *entire* {emphasis in original publication} transit visible in Babylonia."

I have been unable to find the cited reference to Sayce, though Bosanquet and Sayce discuss extensively Babylonian observations of Venus in MNRAS, 40, 565B (1880) (http://adsbit.harvard.edu/cgi-bin/nph-iarticle_query?bibcode=1880MNRAS..40..565B)

Perhaps someone here may be familiar with the "Nature" reference, - what and MAY be a very ancient transit of Venus observation? Jean Meeus: any candidate transits to suggest? -GS-

Delta T

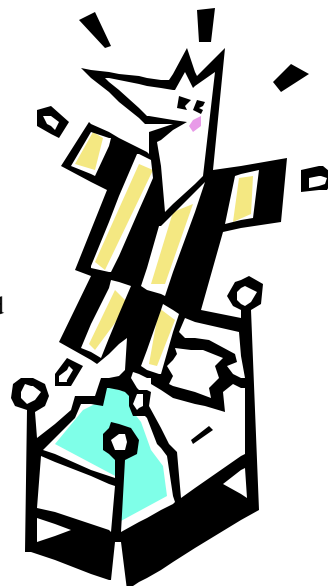
From: Jean Meeus Date: Mon, 03 Nov 2003 20:08:30

On 2003 October 1, the difference between the uniform Dynamical Time and the Universal Time was Delta T = 64.54 seconds.

This value compares as follows to those of the previous years at the same date of the year:

1998 Oct 1 63.34 seconds
 1999 Oct 1 63.71 seconds diff. = 0.37 sec.
 2000 Oct 1 64.01 seconds diff. = 0.30 sec.
 2001 Oct 1 64.22 seconds diff. = 0.21 sec.
 2002 Oct 1 64.42 seconds diff. = 0.20 sec.
 2002 Oct 1 64.54 seconds diff. = 0.12 sec.

For my calculations, I used the extrapolated value Delta T = 65 seconds for both years 2004 and 2005. I have now decided to use 65 seconds again for the year 2006. Jean Meeus



SEScannings

Some updates in the Solar Eclipse Webpages (SEWP)

From: solareclipsewebpagesSENL200311btopenworld.com To: SOLARECLIPSESENL200311aula.com Date: Sun, 12 Oct 2003 20:57:05

Dear All, I have done some updates in the Solar Eclipse Webpages:

1. Solar Eclipse Newsletter Index

See http://solareclipsewebpages.users.btopenworld.com/SENL_files/SENLIndex.PDF

2. Solar Eclipse Links

See http://solareclipsewebpages.users.btopenworld.com/SELlinks_files/SELlinks.html

for the latest individual updates, for next expeditions, etc.

3. Solar Eclipse Mailing List

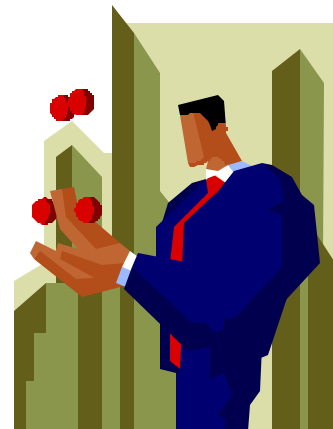
Update on the SEML Status with over 315 subscribers out of over 40 different countries. See http://solareclipsewebpages.users.btopenworld.com/SEML_files/SEMLStatus.htm

and

http://solareclipsewebpages.users.btopenworld.com/SEML_files/SEMLCountries.html

4. The Status of the Solar Eclipse Newsletter with number of pages per issue and relation to the number of solar eclipse related messages appearing on the mailing lists. See http://solareclipsewebpages.users.btopenworld.com/SENL_files/SENLStatus.html

5. Solar Eclipse Conference (SEC2004) with the programme, registration and updated Abstracts of the speakers. Please book your space now. See http://solareclipsewebpages.users.btopenworld.com/SEC_files/SEC2004.html



Web page change

From: MALEY, PAUL D. (JSC-DO511) (USA) To: ""solareclipsewebpagesSENL200311btopenworld.com"" <solareclipsewebpagesSENL200311btopenworld.com> Date: Mon, 13 Oct 2003 10:50:52

Patrick: In your email listing please make the following two changes

1.for my web page: <http://www.eclipsetours.com/maley>

2.for RING OF FIRE EXPEDITIONS: <http://www.eclipsetours.com>

Thanks, Paul - Paul D. Maley Attached Operations Integration DO5 NASA Johnson Space Center Houston, Texas 77058 USA tel. 281.244.0208; fax 281.244.1140 email: paul.d.maley1SENL200311jsc.nasa.gov

Pasachoff BOOK

From: Jay.M.PasachoffSENL200311williams.edu To: solareclipsewebpagesSENL200311btopenworld.com Date: Wed, 01 Oct 2003 19:57:45

I'm glad the book came. Might you mention it on the SEML? It has a Web page at www.williams.edu/astronomy/sun and is also available through www.solarcorona.com. Jay

SEScannings

Index SENL October

Dear all, Please find herewith the Index of the October 2003 issue of the Solar Eclipse Newsletter (SENL). Beside the topic, the page number is listed. Please post your solar eclipse related contributions to us. Thank you.

The SENL can be downloaded free of charge. You only need Adobe Acrobat Reader on your computer. For Adobe see

<http://www.adobe.com/products/acrobat/readstep2.html>

.../...

See the latest SENL and also the complete SENL Index since November 1996 at our Solar Eclipse WebPages at

<http://solareclipsewebpages.users.btopenworld.com>

The SENL will be soon on the WebPages of Fred Espenak/NASA. See

<http://sunearth.gsfc.nasa.gov/eclipse/SENL/> and the index at

<http://www.mreclipse.com/SENL/SENLinde.htm> with example: SENL0011.pdf

<http://sunearth.gsfc.nasa.gov/eclipse/SENL/SENL0011.pdf>

Comments and contributions are welcome at solareclipsewebpagesSENL200311@btopenworld.com

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

Best Regards, Patrick and Joanne

solareclipsewebpagesSENL200311@btopenworld.com

<http://solareclipsewebpages.users.btopenworld.com>

History of Astronomy Book

A Popular History of Astronomy During the Nineteenth Century by Agnes M. Clerke

Price: \$34.95 In stock, same day shipping directly from the publisher. Free Shipping.

Trade Paperback 500 pages Sattre Press ISBN 0-9718305-5-X Size: 6 x 8.75"

This is a facsimile reprint of the 4th edition of 1902. All of the original notes, illustrations and tables are included. Dr. Mary Brück, author of Agnes Mary Clerke and the Rise of Astrophysics, has contributed a new Foreword.

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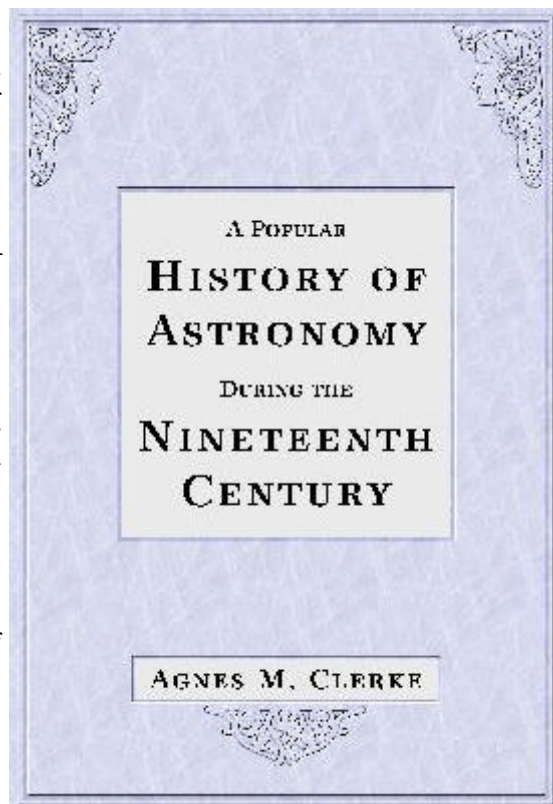
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Origin of the world according to Kant -- Laplace's nebular hypothesis -- Maintenance of the Sun's heat -- Meteoric hypothesis -- Radiation as an effect of contraction -- Regenerative theory -- Faye's scheme of planetary development -- Origin of the Moon -- Effects of tidal friction

Recent Comets

Donati's Comet -- the Earth again involved in a comet's tail -- Comets of the August and November meteors -- Star showers -- Comets and meteors -- Biela's Comet and the Andromedes -- Holmes's Comet -- Deflection of the Leonids -- Orbits of meteorites -- Meteors with stationary radiants -- Spectroscopic analysis of cometary light -- Comet of 1901 -- Coggia's Comet -- Forms of comet's tails -- Electrical repulsion -- Brédikhine's three types -- Great Southern Comet -- Supposed previous appearances -- Tebbutt's Comet and the Comet of 1807 -- Successful photographs -- Schaeberle's Comet -- Comet Wells -- Sodium blaze in spectrum -- Great Comet of 1882 -- Transit across the Sun -- Relations to Comets of 1843 and 1880 -- Cometary systems -- Spectral changes in Comet of 1882 -- Brook's Comet of 1889 -- Swift's Comet of 1892 -- Origin of comets

Stars and Nebulae

Stellar chemistry -- Four orders of stars -- their relative ages -- Gaseous stars -- Spectroscopic star-catalogues -- stellar chemistry -- hydrogen spectrum in stars -- the Draper Catalogue -- Velocities of stars in line of sight -- spectroscopic binaries -- Eclipses of Algol -- Catalogues of variables -- New stars -- Outbursts in nebulae -- Nova Aurigae -- Nova Persei -- Gaseous nebulae -- Variable nebulae -- Movements of nebulae -- Stellar and nebular photography -- Nebulae in the Pleiades -- Photographic star-charting -- Stellar parallax -- Double stars -- Stellar photometry -- Status of nebulae -- Photographs and drawings of the Milky Way -- Star drift

Methods of Research

Development of telescopic power -- Silvered glass reflectors -- Giant refractors -- Comparison with reflectors -- the Yerkes telescope -- Atmospheric disturbance -- the Lick Observatory -- Mechanical difficulties -- the equatorial Coudé -- the photographic camera -- Retrospect and conclusion

Appendix

Chronology, 1774-1893 -- Chemical elements in the Sun (Rowland, 1891) -- Epochs of sun-spot maximum and minimum from 1610 to 1901 -- Movements of Sun and stars -- List of great telescopes -- List of observatories employed in the construction of the photographic chart and catalogue of the heavens

QF 2901 Eclipse Flight Security Fims & Tools

From: Glenn Schneider To: SOLARECLIPSESEN200311AULA.COM Date: Fri, 10 Oct 2003 17:33:02

Pat, I again beg your indulgence using SEML to disseminate this request for information - as I do not have a complete list of all those on the QANTAS eclipse flight, many of whom are registered on SEML.

I have received direct word from the head of QANTAS security that arrangements have been made to permit: (a) the hand inspection of films to be used on the flight, and (b) access to tools for the assembly of equipment. To enable this he has asked for specific information from flight participants. Here, I replicate some of what he has asked in his most recent email to me, to put this in context. If you are on the QF 2901 flight and wish to take advantage of this, please respond to me and cc Phil Asker, as I will consolidate the information and sent it to him.

>Approval has been given by the Australian regulator (DOTARS) for the hand searching of film and for the carriage of a small scientific type took kit.

>The tool kit will need to be delivered to this office sometime prior to the flight in order to meet DOTARS requirements for an inventory and instruction to be written for the CSM.

A) TOOLS

We will prepare a toolkit with an assemblage of "standard" tools such as screwdrivers, wrenches, pliers, allen wrenches, etc. to be stowed on board the flight. Note that the tools will be of "shared use" and in limited supply. If you have your own small tool set you would like to be includes, or even just a "special" tool which you know you will need, please plan on getting it to me in Melbourne BEFORE the eclipse flight. You can contact me specifically about that as needed off SEML.

>Also I now need to know how many passengers, by name ... re the hand screening of film.

B) FILMS

I have already supplied him with the following "short list": Glenn Schneider (myself), Joel Moskowitz, Jay Friedland, Michael Gill, Jean-Luc Dighaye, Jay Pasachoff, Carter Roberts, Craig Small, Matthew Poulton, Steve Kolodny, Daniel Lynch

Please advise if you should be added.

C) PORTS OF ORIGIN/DEPARTURE

>It would also assist knowing the ports these passengers are likely to travel through to and from the flight in order I can alert the screening authorities at those ports and our station managers.

This allowance EXTENDS to those traveling TO/FROM Australia, i.e., if you are originating in European or US or other airports. So IF you respond to either (A) or (B) also send me this information.

D) NOT VIA SEML

Please send email about this to me at gschneiderSEN200311mac.com *AND* put: [ECLIPSE 2003 FILM] in the subject line (so I can sort it with priority against the flood of SPAM and VIRUSES. -GS-

See an icebreaker in Antarctica on webcam ?

From: Klipsi To: SOLARECLIPSESEN200311AULA.COM Date: Sun, 12 Oct 2003 06:06:31

dear friends in preparation of our eclipse trip to Antarctica, here is a fun fact to check out :

The Casey station webcam <http://www.aad.gov.au/asset/webcams/casey/default.asp>

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and Davis <http://www.aad.gov.au/asset/webcams/davis/default.asp> station webcam are not robotic remote controlled, but the people there occasionally change position to show a different view.

Right now Casey shows the coastline. According to public schedule, the Australian ship Aurora Australis should be at Casey next week, from October 17 to 24. It is quite probable that the webcam will point in the direction where the ship is, so you should see that ship.

the Aurora Australis will then return to Hobart. In November it starts another trip and should arrive at Davis station November 15 and stay there till 23. At some point it should sail onward to Zongshan station. Information on various websites are conflicting so I am not sure when exactly they plan to be there. anyway...

Now, hope to see our own ship, the Kapitan Khlebnikov.

I would VERY much appreciate if someone could keep an eye on the Davis webcam on November 21, as our ship should be there on that day. Please check it out every hour, and if you see a ship, save the image to send it to me later. Time zone is of essence.

On 26 November we should be at Casey, so if you see our ship there please save that picture, too.

Hey, if we have time, we will try to walk right in front of the webcam and maybe you can see us there. Anyway, any picture you see with people or ship, please save them for us.

now, if you see a ship on the webcam, how can you know if it is our ship the Kapitan Khlebnikov or the Australian ship Aurora Australis? The form and colours are very different. See these images for comparison.

AA <http://www.aad.gov.au/default.asp?content=dynamic&title=Ships&casid=341&docid=1&type=3&children=1039,1105,2907,2923> the AA is red

KK <http://www.aad.gov.au/default.asp?casid=2907> the KK is black and yellow and with distinct bulk shape.

even if the webcam shows the AA, not the KK, please save the image for me. Thanks

The ultimate image to chase for is on November 21, showing AA and KK together at Davis (may happen, unless the AA is already en route to Zongshan).

2003 Antarctica eclipse meeting in Hobart

From: Babak A. Tafreshi To: SOLARECLIPSESEN200311AULA.COM Date: Mon, 03 Nov 2003 12:53:56

Dear all, This letter is to announce a one day Antarctica eclipse meeting on Dec. 4 in Hobart - Tasmania. I'm editor at Astronomy magazine of Iran (Nojum) and eclipse chaser at Sayeh Eclipse Chasing group (www.shadow-chasers.net). Accompany with another Iranian eclipse chaser we will be onboard kapitan Khlebnikov expedition to Antarctica for observing 2003 total solar eclipse. Sayeh research group in cooperation with Astronomical Society of Tasmania (<http://www.southcom.com.au/~shevillm/ast/>) will hold a The Antarctic Eclipse Meeting in University of Tasmania - Hobart. The meeting is on one Dec.4 (one day after the expedition end in Hobart port) from 9:30 to 15:00. The meeting will focus on reports by experienced eclipse chasers onboard about their Antarctica eclipse projects and this unique expedition. Some of attendees would show part of their documentary videos and images from the whole trip, not just astronomical attractions. Also there will be short presentations for astronomy activities in Iran and Tasmania. All the eclipse chasers onboard the Kapitan Khlebnikov and any enthusiasts who could be in Hobart on Dec. 4 is widely invited to attend this free of entry payment meeting.

This letter is to invite you to attend this conference. It is not a formal meeting just fellow eclipse chasers from around the world come together to talk about their experiences in the Antarctic expedition. Please feel free to write to me for more details. There is no need to registration but if you are attending please let me know so we can estimate the number of people attending before we leave to South Africa.

Kindest Regards Babak A. Tafreshi

Editor at Astronomy magazine of Iran (www.nojum.net)
 Nature and night sky photographer (www.dreamview.net)
 Sayeh Eclipse Chasing Group www.shadow-chasers.net)

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LMC Visibility

From Klipsi

From near Mirny station, the Large Magellanic Cloud will be near zenith (at about 70 deg elevation above SW horizon during totality, with the eclipsed Sun in the ESE). Thus it appears quite bright. If, and that is a very big if, we had perfect clear skies, or at least the zenith area is clear, could it be seen during totality? what is the visual magnitude of the LMC when it is so high in the sky?

From Fraser Farrell

I very much doubt that you would see it during totality. I note that the LMC is effectively invisible if any of the following are true:

- There is a full or near-full moon in the sky (unless it's eclipsed).
- You are being directly illuminated by any street light or "security" light within ~50 metres.
- You are looking through the light pollution over any town with more than ~10000 people.
- It is less than ~40 minutes after sunset, or before sunrise.

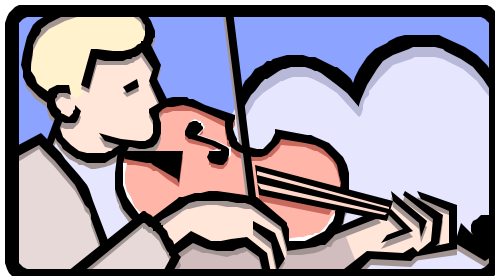
And of course if there's any dust, aerosols, pollen haze, sea spray or mist happening in your "clear sky" then the LMC gets wiped out by those. I've had many moonless but windy nights here when the LMC is difficult to see directly even at maximum elevation (~60 deg).

The brightest part of the LMC is the Tarantula Nebula (NGC 2070), which is comparable in naked-eye appearance to objects such as 47 Tuc or the Orion Nebula. The central bar of the LMC is of similar surface brightness to the nucleus of the Andromeda galaxy; although noticeably more detailed. The rest of the LMC is rather faint and spread over several degrees of sky. Best appreciated through big binoculars or a rich-field telescope.

Although the LMC emits a lot of light it's coming from a large patch of sky. I often use the LMC to illustrate the meaning of Integrated Magnitudes to novice astronomers. The Integrated Magnitude of the LMC is 1.5 visual, which is the same as the -stellar- visual magnitude of Gamma Crucis. Guess which one is easier to see from suburban backyards...or during those frantic moments of totality?

Of course you could get lucky and have another LMC supernova go off in the next few weeks. I followed 1987A through a couple of full moons :-)

And before anyone asks, the Small Magellanic Cloud is significantly fainter than the LMC. cheers, Fraser Farrell



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3**Prospective list of everybody's arrangements for the eclipse**

From: Jay.M.PasachoffSENL200311williams.edu To: solareclipsesSENL200311aula.com Date: Sun, 02 Nov 2003 17:23:01

Here is everything I know about expeditions and experiments. I would be glad to have comments, additions, and corrections. After correction, I intend to post this on our IAU Web site at www.eclipses.info. Jay Pasachoff

Observing Groups

Astronomical Tours/ICstars (Vic and Jen Winter) www.astronomicaltours.net www.icstars.com Land tour 18 Nov - 26 Nov to Novolazarevskaya Blue Ice Runway ex Cape Town

<http://www.astronomicalTours.net/Antarctica2/Index.html> Scientists from India are participating. satyendra bhandari <satyendra_bhandariSENL200311yahoo.com> is intending to go to Maitri, and I am not sure if he is part of this group or not.

New Zealand Group details unknown A scientists from Malaysia is included.

Swiss Group Return-Path: Didier.RaboudSENL200311obs.unige.ch www.antarctica2003.ch see especially http://www.antarctica2003.ch/experiences_light.htm and Ressources pour les enseignant-e-s. Dr Didier Raboud Coordinateur de la Passerelle Science-Cite 10 Av. Jules Crosnier 1206 Geneve, Suisse T +41 79 349 88 94, Didier.RaboudSENL200311obs.unige.ch, www.science-cite.ch

Croydon Travel Qantas Boeing 747 flying roundtrip from Melbourne Glenn Schneider, Jay Pasachoff, and many others on board. http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_03/ECLIPSE_03.html <http://www.antarcticaflights.com.au/> Glenn will operate the equipment from the navigator's seat through a good window and on a gyro. The equipment will include Jay Pasachoff (Williams College)'s SBIG 1024x1024 CCD with 300-mm lens, green filter Joel Moskowitz's Sony DCR TVR 900 NTSC video camera Jay Friedlander's 500 mm f/5.6 lens, which is similar to Jean-Luc L. J. Dighaye's 500mm f/4.6 cat lens, using Jay Friedlander's Pentax ZX-5n Jay Pasachoff's Nikon Vibration-Reduction 80-400 mm zoom on Joel Moskowitz's Nikon F5.

Travelquest International/Sky and Telescope Lan Chile Airbus 340 flying roundtrip from Punta Arenas, Chile Kelly Beatty leading <http://www.travelquestinternational.com>

Quark Expeditions Kapitan Khlebnikov icebreaker with 100 passengers, 28 days at sea http://www.quarkexpeditions.com/cgi-bin/future_view.pl?ID=4&MODE=VIEW November 4--December 3, 2003 Port Elizabeth, South Africa, to Hobart, Australia

Japanese public television: NHK TV Making a television program; JMP was interviewed on 10/30/03 They have people in Antarctica filming aurora, and they have a flight scheduled for eclipse day out of Mirny. They will be out of range for live transmission but will radio back their videotape as soon as they get into range. They are using HDTV.

Eclipse cruise

From: Jay.M.PasachoffSENL200311williams.edu To: solareclipsesSENL200311aula.com Date: Sun, 02 Nov 2003 15:54:07

I think the icebreaker leaves from South Africa tomorrow for its 28 days at sea, including the eclipse. I wish bon voyage and good observing to Klipsi, Fred, and all the others on it.

Those of us in the air on eclipse day, and others, will be thinking of them. Best wishes, Jay Pasachoff

From: Dale Ireland

Have you checked your flight path against the sailing schedule for the ice breaker to determine if you might be able to spot the ship from the air, and visa versa? Dale

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From: Klipsi

> I think the icebreaker leaves from South Africa tomorrow

actually, we leave in a few days, on november 5. Arriving Hobart december 3. I am reporting live daily on <http://eclipse.span.ch/antarctica2003.htm> . click LATEST NEWS . Starting november 5 I'll call my brother in San Diego who will be doing the webupdates (he was lucky, just a few miles from the Poway fires. He even put a webcam from his window so he would see if his house was going to burn up www.staigerland.com/webcam while he was at work . All my sympathy and thoughts to you, Evan. Thank God your family is alive, THAT is the most important thing.

I arrived this evening in Port Elizabeth, South Africa. Nice area, looks like San Diego...except for the fires.

other friends from Geneva are reporting in french on www.antarctica2003.ch . We have Inmarsat B satphone with 64k upload capability, so we should be able to also upload some larger images and videoclips, not just text. We will try to do it as entertaining as possible. Another webreport should come on www.live-eclipse.org and also from www.shadow-chasers.net All on same ship. They also both have Inmarsat B satphones.

I guesss we might want to contact Guinness book for record number of satellite phones present on one single ship ... ;-) hehe... Klipsi

From: Peter Tiedt

I had brunch with Klipsi this morning in Johannesburg (I was there for the weekend).

Klipsi is certainly looking forward to the cruise, and has obtained some impressive equipment, both for the eclipse, penguins and ice.

The ship leaves Port Elizabeth on the 5th, with the party assembling the day before. Peter Tiedt

From: Dale Ireland

I haven't been reading all the posts, did Evan's house burn in the fires??? Dale

From: Glenn Schneider

Dale, There is a lot of detail in this, and indeed I had checked into this. It depends entirely how close to the coast the ship manages to get - which actually is not that close on their baseline plan. That would require too much of a diversion for us. If the ice thins, and if the seas cooperate... we may pull off that trick yet. -GS-

From: Glenn Schneider

Olivier, Jen, et al., Can you - and any others on sea or ground - again send me your confirmed satellite phone numbers. We will have the availability to initiate satellite calls on our flight, but will not be able to receive any. Any replies can come off-SEML. Cheers, Glenn Schneider

From: Jen Winter - ICSTARS Astronomy

The Kaptain Khlebnikov / eclipse cruise passengers all gather in Port Elizabeth on Tuesday, Nov 4th. We have already said "bon voyage" to a good number of our folks headed out a few days early for the expedition. The ship was a virtual sell-out with some 110 guests and a formidable expedition staff. We should note that not only Fred Espenak will be aboard, but also the very popular and respected astronomer, Professor Parkinson of the UK will be aboard.

The eclipse cruise isn't scheduled to come close-in enough onto the Antarctic continent to see the aircraft or vice-versa. The fly -over path is significantly different than the path taken by the Kaptain Khlebnikov. The intended intercept point will be selected based on weather and ice conditions in the days and hours prior to totality. As the ice pack close to shore in this area _can_ grow as deep as 10 meters thick, it is important not to begin a course inward into that ice-pack until the best weather interpretations are made. On our

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last discussion with the expedition leaders, the plan was to linger to the outside of the ice-pack until a sound interpretation of weather could be made, then drive the icebreaker inland to the point of longest duration, and best weather opportunity. The ice would then become thicker and thicker until the "ice-breaking" capacity of the ship is required to drive further inland. The expedition expects that the ultimate observation point will be in this type of environment, where observers will be able to debark the ship (safely) onto the pack ice the ship is moored within for eclipse observing. It would be unlikely, (but not impossible) that the ship actually manage the journey to the edge of the land-mass near Mirny, as the ice-pack can still be very dense in the Antarctic springtime.

Also, I have just remembered another investigation aboard the Kaptain Khlebnikov with our Astronomical Tours group. In association with ALPO, (the Association of Lunar and Planetary Observers), Fred Espenak and some other team members with Astronomical Tours will attempt to collect some follow-up data on exact GPS locations of some Venus Transit observation stations on the Kergeulen Islands along the way. These islands are not often visited at all, much less by people who care about exact coordinates of these last observations. This will give ALPO the chance to revise reports by the Royal Astronomical Society with a new degree of accuracy.

Klipsi hopes to be posting images to his website, but we should note that even with an irridium phone and net connection, there are large areas of poor coverage and slow connections. We look forward to any and all news sent - if our offices receive any photos or live images, they will be posted at: www.AstronomicalTours.net - or www.ICSTARS.com Clear Skies, Jen Winter - Owner

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. solareclipsewebpages@btoopenworld.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.

HOW TO SUBSCRIBE: IN THE BODY OF THE MESSAGE TO listserv@Aula.com SUBSCRIBE SOLARECLIPSES name, country.

Request for Cloud (!) Observations

From: Glenn Schneider To: SOLARECLIPSES-SEN200311AULA.COM Date: Tue, 04 Nov 2003 17:17:00

I received the following email/request request/query from Dr. Andrew Klekoick, which is self-explanatory. While we all hope for crystal clear skies (scratch that, NO crtystals - just clear) on Land, Sea, and Air for TSE 2003, a few noctolucenct clouds in the anti-sunward direction MIGHT be acceptable... Here is the relevant part of his correspondnce. If you might be able to assist him please reply to him directly. I would ask Kelly, Jen and Vic, to please pass this others on their respective expeditons. Cheers, Glenn Schneider

Andrew Klekociuk wrote: Dear Dr Schneider Greetings. I am the Australian Antarctic Division's representative on the QANTAS/Croydon Nov 23 solar eclipse flight, and PI for a middle atmosphere lidar at Davis station. I look forward to meeting you before the flight.

One of my research interests is the observation of noctilucnt (polar mesospheric) clouds in Antarctica. It would seem that the time near totality offers a unique opportunity to visually detect these clouds, and their observation and photography is something that people on the starboard (non-eclipse) side of the aircraft could participate in. There have been very few noctilucnt cloud observations from Antarctica, and the timing of the eclipse coincides with the start of the cloud season.

I was wondering if you know of any efforts to observe these clouds during our flight from the Adventure Associates Kapitan Khlebnikov cruise.

The specific observations that I am interested in are photographs of the clouds with good information on time, camera focal length and viewing direction. If reference points can be included in the images (eg aircraft wing, surface feature, sun, shadow, astronomical body) then this should enable viewing directions to be estimated in combination with aircraft trajectory information. These photographs would then be used to estimate the ground-projected position of the clouds for comparison with satellite observations (SBUV/2, SNOE, POAM etc). Anyhow, I look forward to any comments you may have. Cheers Andrew

Dr. Andrew Klekociuk | Email: andrew.klekociukSEN200311aad.gov.au Research Scientist - Lidar | Phone (local): 03 6232 3382 Space and Atmospheric Sciences | Phone (international): +61 3 6232 3382 Australian Antarctic Division | Reception: ... 6232 3209 Channel Hwy., Kingston | Fax: ... 6232 3496 Tasmania, 7050. Australia | Local Time: UT+10h (+11h Oct.-Mar.) Web page: <http://www.aad.gov.au/default.asp?casid=222>





Joanne & Patrick

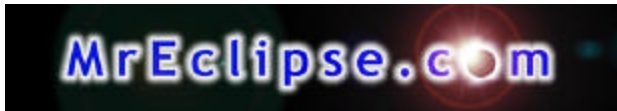
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Female Male

