

SOLAR ECLIPSE NEWSLETTER

INDEX

The sole Newsletter dedicated to Solar Eclipses

2 SECalendar April
9 SECalendar April - van den Bergh
9 SECalendar April - Titanic
10 SECalendar April - Bob Morris
10 SEC2004 Attendees
11 SENL March Index
12 Feb 26 in snowy cold Canada
12 Delta T
12 Eclipse pathwidth 31/05/2003
13 Picture Sun by Arie Nagel
13 From: "Arie Nagel"
13 Transient lunar and solar phenomena during eclipses
14 QF2901 - A Stratospheric Eclipse?
14 Picture Graph QF2901 A Stratospheric Eclipse tropopause_map_20031124_0000
15 Picture Graph QF2901 A Stratospheric Eclipse tropopause_map_20031123_1200
16 Picture Graph QF2901 A Stratospheric Eclipse
17 The first full solar eclipse by Phobos ...
17 Picture The first full solar eclipse by Phobos
1P132176252ESF05A6P2670R8M1-THM
17 Picture The first full solar eclipse by Phobos
1P132176262ESF05A6P2670R8M1-THM
17 Eclipses or transits?
17 Picture eclipses from mars JSC collection Schneider message S66-63415
17 Picture eclipses from mars MERB_First_Transits-B043R1
18 Coming soon: solar eclipse photos from Mars
18 Picture eclipses on mars mer_banner
19 Picture eclipses on mars
1P131641497ESF0544P2666R8M1-THM
20 Picture eclipses on mars
1P131641507ESF0544P2666R8M1-THM
21 Concorde and June 30, 1973 eclipse
21 Picture concorde headsmall
22 Picture concorde dgfront
24 More Fun
25 Free! Copies of NASA's 2003, 2002 and 1998 eclipse bulletins
25 Full-silhouette solar eclipses
31 Astronomy & Esperanto
32 Dr. Janet Mattei
33 Picture Dr. Janet Mattei
34 Problem of "nerves" during eclipses
36 Venus Saros
36 Venus Transit with Solar Scope
36 Picture Banner Solar Scope

Dear All,

The Transit of Venus is getting closer. The contributions in this SENL show. But as well the upcoming Hybrid eclipse of 2005. Do not forget the international Solar Eclipse Conference in August. Hope to see you all there.

Clear skies,

Joanne and Patrick

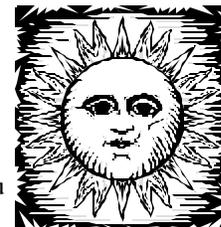
36 Picture Solar Scope
37 Picture Solar Scope (4x)
37 Transit_de_Vénus_du_8_juin_2004
38 Venus Transit Details
43 Venus Transit
44 Close Approach
44 Passage
44 Picture Passage
45 Venusovergang 8 juni
45 Picture venus overgang eso vt-button
45 Picture venusovergang l aventure des transits zon%204
46 Picture venus overgang venustransit%20ESO%20logo
46 VVS-site: Venusovergang
46 Venus Transit Effects on Earth
47 Movie of Todd's 1882 Transit Photos
47 Transits of Earth as seen from other planets
48 Picture Viewing from Mars
49 Transit of Venus - Black Drop/Limb Crossing Observations
49 Venus Transit Animations
50 Picture Venus Transit Animations
51 Transit from North America
51 Chasing Venus" exhibition and lecture series at the Smithsonian
52 October eclipse in Nome Alaska
53 New Tahiti 2005 options
54 more options! - Totality 2005
56 Crowds at Pitcairn island & nearby
56 Pitcairn port call of MV Discovery
57 Pitcairn question
58 Serpent in Paradise by Dea Birkett
58 S&T advertisement
59 NASA HSE2005 web page
59 Sea and wave heights from Jay Anderson
60 Ships & stabilizers
63 Two years from today ...

SECalendar



Dear All,

Please find herewith the solar eclipse calendar (SECalendar) for April. If you have any additional information, queries or remarks, please drop us a mail.



have

For the whole Solar Eclipse Calendar, see our Solar Eclipse WebPages at

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

April 01, 0637 Total solar eclipse on April's fool day. Beside this date, and the last and next April's fool day total solar eclipses in the years 740 and 2899, are these 3 total solar eclipses the only total solar eclipses on April 1 between 0 and 3000. April 01, 0740 is the last total solar eclipse on April's fool day. April 01, 1764 Annular eclipse visible in Ukkel and on April's fool day. The altitude was 42 degrees. The other central eclipses between 0 and 3000 where partial in Ukkel, Belgium: in 740 (total), 1621 (annular), 2136 (annular), 2899 (total) with magnitudes 0.053; 0.553; 0.636; and 0.245. April 01, 1783 was the last solar eclipse on April fools day. This was a partial solar eclipse. The next solar eclipse on this day will be in 2098; also a partial solar eclipse. Next total solar eclipse on April's fool day is April 01, 2899.

April 01, 1764 "It will be Eclipse first, the rest nowhere." Dennis O'Kelly (at Epsom, 3 May 1769) (Quoted in The Penguin Dictionary of Quotations by Cohen and Cohen. In UK Solar Eclipses from Year 1, Sheridan Williams says: "One of the world's most successful racehorses was born around the time of this [annular eclipse of 1 April 1764] and was named Eclipse. The Eclipse Stakes, named after that horse, are still run today, and the horse of the year awards in the U.S. are called Eclipse Awards after him."). Ref. SW.

April 01, 1764 In a letter Reverend W. Stukely, Rector of St. George in Kent, to the Whitehall Evening Post (out of his dairy, volume XX p. 44): In regard to the approaching solar eclipse of Sunday April 1, I think it advisable to remark that, it happening in the time of divine services, it is desired you would insert this caution in your public paper. The eclipse begins soon after 9, the middle a little before 11, the end a little after 12. There will be no total darkness in the very middle, observable in this metropolis, but as people's curiosity will not be over with the middle of the eclipse, if the church service be ordered to begin a little before 12, it will properly be morning prayer, and an uniformity preserved in our duty to the Supreme Being, the author of these amazing celestial movements. (Ref. SLK 06/99).

April 01, 1764 Probably the first solar eclipse map with the complete eclipse visibility (including the zone of partial phase) drawn by Robert Health in <A General and Particular account of the Annular Eclipse of the Sun of 1763 April 1>. Since 1830, the English yearbook The Nautical Almanac, published eclipse maps. (Ref. SLK 06/99).

April 01, 1970 Minor planet (1976) Kaverin 1970 GC. Discovered 1970 April 1 by L. I. Chernykh at Nauchnyj. Named in memory of Aleksej Aleksandrovich Kaverin (1904-1976), an instructor in astronomy at Irkutsk Pedagogical Institute, expert in the field of the theory of eclipses. (M 4190) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 01, 1976 Minor Planet (2849) Shklovskij 1976 GN3. Discovered 1976 April 1 by N. S. Chernykh at Nauchnyj. Named in honor of Iosif Samuilovich Shklovskij {1916-1985}, corresponding member of the USSR Academy of Sciences, professor at Moscow University and member of the staff at the Space Research Institute. A brilliant popularizer of astronomy, he has also made substantial contributions to research on the solar corona, galactic radio emission and various cosmic objects. (M 8543) Obituaries published in Astron. Zh., Tom 62, Vyp. 3, p. 618-619 (1985); Kosm. Issled., Tom 23, Vyp. 3, p. 495 (1985); Pis'ma Astron. Zh., Tom 11, No. 4, p. 319-320 (1985); Rise hvezd, Vol. 66, No. 6, p. 113 (1985); Astron. Vestn., Tom 19, No. 4, p. 359-361 (1985); Sky Telesc., Vol. 70, No. 2, p. 109 (1985); Sov. Astron., Vol. 29, No. 3, p. 364-365 (1985); Sov. Astron. Lett., Vol. 11, No. 2, p. 131-132 (1985); Sterne, 61. Band, Heft 4, p. 232-234 (1985); Sterne Weltraum, 24. Jahrg., Nr. 8-9, p. 427 (1985); Zemlya Vseleennaya, No. 4, p. 44-46 (1985); Astron. Zh., Tom 63, Vyp. 5, p. 835-838 (1986); Q.J.R. Astron. Soc., Vol. 27, No. 4, p. 700-702 (1986);

(Continued on page 3)

SECalendar

Sov. Astron., Vol. 30, No. 5, p. 495-497 (1986). Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 01, 1976 Minor Planet (4165) Didkovskij 1976 GS3. Discovered 1976 April 1 by N. S. Chernykh at Nauchnyj. Named in honor of Leonid Vladimirovich Didkovskij (1948-), astrophysicist and deputy director of the Crimean Astrophysical Observatory {see planet (1725)}. He is known for his research on the brightness oscillations of the sun, for his development of scientific instrumentation for the Soviet space telescope "Astron" and for his work with the active main mirror on the 1.7-m Space Telescope "Spectrum UV", an international project. (M 34340) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 01, 1976 Minor planet (4683) Veratar 1976 GJ1. Discovered 1976 April 1 by N. S. Chernykh at Nauchnyj. Named in honor of Vera Petrovna Tarashchuk, an astrophysicist at the Astronomical Observatory of Kiev University. An active observer of major planets, minor planets and comets, she is known for her contribution to photometric and spectroscopic research on minor bodies. She also studied the association of cometary processes with solar activity, as well as the structure and rotation of minor planets. (M 30095) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 02, 1925 Death of Johann Palisa, Austrian astronomer. Discovered 125 minor planets (Ref. A by EE). He gave many names of Minor Planets to solar eclipse related places or persons. He also observed eclipses.

April 02, 1952 Death of Bernard Ferdinand Lyot in Cairo, French astronomer and engineer. Studied polarization of moonlight and planets. Later mainly solar research. Constructed coronagraph in 1930 and the 'lyot-filter' or monochromatic polarizing filter.

April 02, 1998 Launch of Trace, American Satellite for research of the sun in UV and XUV.

April 03, 0033 "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.

April 03, 1976 Minor planet (3493) Stepanov 1976 GR6. Discovered 1976 April 3 by N. S. Chernykh at Nauchnyj. Named in memory of Vladimir Evgen'evich Stepanov (1913-1986), a corresponding member of the former Soviet Academy of Sciences, well-known for his work in solar physics and solar-terrestrial relations. For many years he led the solar researches at the Siberian Institute of Terrestrial Magnetism, Ionosphere and Radio Wave Propagation, and he did much for the development of astronomy in Siberia. (M 20835) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 04, 1807 Death of Joseph Jerome le Francois de Lalande (1732-1807), French astronomer. Calculated the distance of the sun in 1771 to 154,198 mio km. (Ref. Rc 1999)

April 06, -0647 (648BC) "Nothing can be surprising any more or impossible or miraculous, now that Zeus, father of the Olympians has made night out of noonday, hiding the bright sunlight, and . . . fear has come upon mankind. After this, men can believe anything, expect anything. Don't any of you be surprised in future if land beasts change places with dolphins and go to live in their salty pastures, and get to like the sounding waves of the sea more than the land, while the dolphins prefer the mountains." May refer to a total solar eclipse of 6 April 648 BC. Archilochus, Greek poet (c680-640 BC). Quoted in Historical Eclipses and Earth's Rotation, by F. Richard Stephenson, Cambridge University Press, 1997, page 338. Partly quoted in Encyclopaedia Britannica CD 98. Ref. FE 01/01

April 06, -0647 (648BC) "Zeus, the father of the Olympic Gods, turned mid-day into night, hiding the light of the dazzling Sun; and sore fear came upon men." Archilochus (c680-c640 BC), Greek poet. Refers to the total solar eclipse of 6 April 648 BC. Ref. FE 01/01

April 06, 1852 Sir Edward Sabine (1788-1883) mentioned a correlation between sunspots and magnetic disturb on earth. (Ref. Rc 1999).

(Continued on page 4)

SECalendar

April 06, 1855 Minor Planet (34) Circe Discovered 1855 April 6 by J. Chacornac at Paris. Named for the enchantress, daughter of the Sun, celebrated for her knowledge of magic and venomous herbs. Circe changed the companions of Odysseus {see planet (1143)} into pigs. She had no influence on Odysseus because Hermes protected him. Odysseus lived a year with Circe, his friends were retransformed into men. (H 6) The planet was named by the members of Paris observatory. Ref. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 06, 1916 Minor Planet (857) Glasenappia Discovered 1916 April 6 by S. I. Belyavskij at Simeis. Named in honor of Sergej Pavlov Glasenapp (1848-1937), director of the Observatories in Pulkovo (1870-1877) and St. Petersburg (1893). Glasenapp worked on visual binaries and on the satellites of Jupiter. He observed the transits of Venus and Mercury and several solar eclipses. Glasenapp was a founder of the Russian Astronomical Society. (H 84) Glasenapp is also honored by a lunar crater. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 08, 1652 ". . . [the Sun was reduced to] a very slender crescent of light, the Moon all at once threw herself within the margin of the solar disc with such agility that she seemed to revolve like an upper millstone, affording a pleasant spectacle of rotatory motion." Dr Wyberg, observing the total solar eclipse of 8 April 1652 at Carrickfergus, Scotland. Ref. SW.

April 08, 1946 Birthday of eclipse chaser Peter Tiedt from South Africa. Peter performed enormous work, including his web-pages, for the African solar eclipses in 2001 and 2002.

April 08, 1947 Largest sunspot group ever observed. Surface 18.1 billion square km.

April 08, 1968 Death of Harold Delos Babcock, American astrophysics. Studied laboratory spectra, magnetic field of the sun, constructed solar magnetograph.

April 09, 1046 <Ch'ing-li reign period, 6th year, 3rd month, day hzin-szu, the first day of the month. The Sun was eclipsed by 4 1/2 divisions. At 3 marks in the hour of shen it was restored> Wen-hsien, T'ung-k'ao, chap283 (Ref. PG 3/99)

April 09, 1567 Christoph Clavius (1537-1612) witnessed two spectacular Eclipses of the Sun in the space of 7 years. <The other I saw at Rome in the year 1567 also about midday in which although the Moon was placed between my sight and the Sun it did not obscure the whole Sun as previously but a narrow circle was left on the Sun, surrounding the whole Moon on all sides.>. Clavius 1593 p 508 In sphaeram Ioannis de Sacrobosco, Commentarius. (Ref. EJ 98, PG 3/99)

April 09, 2043 The only non-central total solar eclipse in that century. The central line of this total solar eclipse is missing the surface of the earth near the North Pole. The last century there were 3 such total solar eclipses: 19 May 1928, 23 October 1957 and 2 November 1967 all near the South Pole. The years 1957 and 2043 do have two non-central solar eclipses while also the central line of the annular eclipse does miss the earth. (Ref. SLK 6/99).

April 10, 0628 <36th year of Empress Suiko, spring, 2th month, 27th day. The Empress took to her sick bed. 3rd month, 2nd day. There was a total eclipse of the sun. 6th day. The Empress' illness became very grave and death was unmistakably near. 7th day. The Empress died at the age of seventy-five> Translation Aston 1972, p155 (Ref. PG 3/99)

April 10, 1698 This was the last total solar eclipse visible on Tahiti. Not that strange in time, but knowing that the next Total Solar Eclipse will be 2 March 2910. Ref. JM 09/99.

April 10, 1813 Death of Joseph Louis Lagrange (1736-1813), French mathematician and astronomer. Described the 3 points, later called Lagrange Points.

April 11, -0368 (369 BC) <Artaxeres II, year 35, month XII. In 6 deg daytime 1/3 of the disk was covered> British Museum tablet 37097 and 37211 (Ref. PG 3/99)

April 11, 1176 "In this year 1487 (Seleucid), on New Sunday, the 11th of the month of Nisan [April], at daybreak, at the end of Office, that is, after the reading of the Gospel, the Sun was totally obscured; night fell and the stars appeared; the Moon itself was seen in the vicinity of the Sun. This was a sad and terrifying sight, which caused many people to lament with weeping; the sheep, oxen

SECalendar

and horses crowded together in terror. The darkness lasted for two hours; afterwards the light returned. Fifteen days after, in this month of Nisan at the decline of Monday, at dusk, there was an eclipse of the Moon in the part of the sky where the eclipse of the Sun had taken place . . ." Refers to a total solar eclipse at Antioch of 11 April 1176. From: Chronicle of Michael the Syrian. Ref. FRS 1997.

April 11, 1176 "In this year the Sun was eclipsed totally and the Earth was in darkness so that it was like a dark night and the stars appeared. That was the forenoon of Friday the 29th of Ramadan at Jazirat Ibn 'Umar, when I was young and in the company of my arithmetic teacher. When I saw it I was very much afraid; I held on to him and my heart was strengthened. My teacher was learned about the stars and told me, 'Now, you will see that all of this will go away', and it went quickly." Refers to a solar eclipse of 11 April 1176. Jazirat Ibn 'Umar is now Cizre in Turkey. From: Ibn al-Athir.. Ref. FE 01/01.

April 11, 1176 "The Sun was eclipsed and it became dark in the daytime. People were frightened and stars appeared." Refers to the solar eclipse of 11 April 1176. From: Imad al-Din, Islamic. Chronicle of the crossing of the Orontes River, near Hamah (in present-day Syria) by Saladin and his army. Quoted in Encyclopedia Britannica CD 98. Ref. FE 01/01.

April 11, 1176 (Sunday) <In this year 1487 (Seleucid), on New Sunday, the 11th of the month of Nisan, at daybreak, at the end of Office, that is, after reading the Gospel, the Sun was totally obscured, night fell and the stars appeared, the Moon itself was seen in the vicinity of the Sun. This was sad and terrifying sight which caused many people to lament with weeping, the sheep, oxen and horses crowded together in terror. The darkness lasted for two hours, afterwards the light returned. Fifteen days after, in this month of Nisan at the decline of Monday, at dusk, there was an eclipse of the Moon in the part of the sky where the eclipse of the Sun had taken place> Chronicle of Michael the Syrian, book XX, chap 3, translation from the rendering into French by Chabot (1905, vol3, p367). Ref. PG 3/99

April 11, 1862 Birth of William Wallace Campbell (1862-1938), American astronomer. Studied spectra of comets, corona and atmosphere of the sun. (Ref. Rc 1999). Dr. Campbell had been to many total solar eclipses: 1898 in India, 1900 in Georgia, 1905 in Spain and 1908 in Flint Island of the South Pacific. He had been to other total eclipses as well, but on the ones just mentioned he had secured spectra of the sun's chromosphere, the pinkish-hued atmosphere of the sun that gives, when the moon covers the bright, shining surface, a spectrum of bright lines.... Ref. SENL 04.02.

April 11, 1875 Death of Samuel Heinrich Schwabe (1789-1875), German amateur astronomer. Searched for the planet in the orbit of Mercury. Discovered in 1843 the sunspot cycles. (Ref. Rc 1999)

April 11, 1898 Birth of Robert d'Escourt Atkinson at Rhayader in Wales. On November 01, 1948 the Eclipse Comet, only 2 degrees from the Sun, and observed during totality in Nairobi, Kenya, photographed by R. d' E. Atkinson. After, the comet was observed till April 3, 1949 in the southern hemisphere. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

April 12, 1851 Birth of Edward Walter Maunder F.R.A.S. in Middlesex, England. Died 1928, March 21, Greenwich, London, England. Ref. MK 5/99

April 12, 1889 Death of Warren de la Rue (1815-1889), UK. Royal Society also mentions 12 or 19 April 1889. Warren de la Rue (1815-1889), UK and Angelo Secchi (1818-1878), Italy, use photography during a solar eclipse in Spain to demonstrate that prominences (and hence at least that region of the corona) are part of the Sun, not light scattered by the Earth's atmosphere or the edge of the Moon, because the corona looks the same from sides 250 miles apart. (Ref. Rc 1999)

April 13, 1763 The only central eclipse which will be visible in Mecca (21.4333N and 39.8166E) and in the (mathematical) Ramadan month is the annular eclipse of Wednesday 13 April 1763 or on 29 Ramadan 1176.

April 14, 1905 Death of Otto Wilhelm von Struve (1819-1905) in Karlsruhe, Russian astronomer. Discovered 547 double stars, studied rings of Saturn and parallax of the Sun. (Ref. Rc 1999)

April 14, 1972 Launch of Prognoz 1, Russian satellite for research of the sun and X-rays.

(Continued on page 6)

SECalendar

April 14, 1976 Helios 2, German Solar mission comes close to the sun at 43,4 million km.

April 14, 1991 Minor planet (6558) Norizuki 1991 GZ. Discovered 1991 April 14 by K. Endate and K. Watanabe at Kitami. Named in memory of Sojiro Norizuki (1912-1995), founder of Norizuki Technical Works. Under the guidance of H. Tanaka, he constructed the first parabolic antenna for solar observations in Japan in 1949. He was later engaged in the construction of the interferometer at the Nobeyama Solar Radio Observatory and for other radio telescopes. After 1972 he extended his work to infrared and optical telescopes. (M 30099) Name proposed by the second discoverer following a suggestion by K. Tomita. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 15, -0135 (136 BC) <Year Se 175, month XII. the 29th, at 24 deg after sunrise, solar eclipse, when it began on the south-west side, in 18 deg day towards noon it became entirely total> British Museum tablet 34034 and 45745, translation Hunger (Ref. PG 3/99)

April 15, -0656 (657 BC) <On the 28th day, at 2 1/2 double hours of the day in the west it also covered 2 fingers towards it made an eclipse> Assyrian British Museum tablet, translation Hunger 1992, p63 (Ref. PG 3/99)

April 15, 1707 Birth of Leonhard Euler (1707-1783), Swiss mathematician and astronomer. Observed the transit of Venus in 1769 and concluded that the sun has a distance of 151.225.000 km. (Ref. Rc 1999)

April 15, 1985 (5100) Pasachoff 1985 GW. Discovered 1985 April 15 by E. Bowell at Anderson Mesa. Named in honor of Jay M. Pasachoff, Field Memorial professor of astronomy, director of the Hopkins Observatory and chair of the astronomy department of Williams College, Williamstown, Massachusetts. Pasachoff's broad range of astronomical research has centered on the sun, and especially on studies of solar eclipses. He is also well known for an extensive series of college-level textbooks and popular-astronomy textbooks and articles. Besides being an indefatigable public lecturer, Pasachoff has served as chairperson of the astronomy section of the American Association for the Advancement of Science, as a committee member of the American Association of Physics Teachers and on the Astrophysics Council of the National Aeronautics and Space Administration. (M 21956) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 15, 1997 Dr. Richard Tousey, a physicist and long-time employee at the Naval Research Lab, died of pneumonia at Prince Georges Hospital Center on 15 April 1997; he was 88. One of his experiments involved an expedition to Peru to observe a Solar Eclipse at sunset from an airplane. The experiment came to nothing because the 4 engine airplane lost 2 engines over the Andes mountains. Fortunately the airplane managed to return safely.

April 16, -1177 (1178BC) ". . . and the Sun has perished out of heaven, and an evil mist hovers over all." Said to refer to a total solar eclipse of 16 April 1178 BC. From: Homer (Greek), The Odyssey (8th century BC).

April 16, 1893 As per Edward Singleton Holden (1846 - 1914) , Schaeberle discovered a comet like object on the plates of the eclipse from Chili. The comet was 0,8 moondiameters from the moon. In May 1894 Schaeberle identified the comet on the plates of the British eclipse expeditions to Brazil and Africa, and the measured distances were respectively 1,15 en 1,5 moondiameters.

April 16, 1993 Minor Planet (6201) Ichiroshimizu 1993 HY. Discovered 1993 April 16 by K. Endate and K. Watanabe at Kitami. Named in honor of Ichiro Shimizu (1923-1996), who began work for the Tokyo Astronomical Observatory in 1945 and was heavily involved in the construction of the Corona Observing Station on Mt. Norikura. He was later a key astronomer in the solar physics division of the Observatory until he retired in 1984. (M 29146) Name proposed by the second discoverer following a suggestion by K. Tomita. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 17, 1912 Central solar eclipse in Belgium, prior to the last in 1999. This eclipse of April 17, 1912 was annular (nearly total) in Belgium. The line of centrality went just west of Paris. The weather in Paris and London (and also surrounding areas) was absolutely perfect. This may have been, in 1912, the most observed eclipse in history. In a major Paris newspaper, an observer likened one phase of the eclipse to <an engagement ring>. Since an engagement ring traditionally has diamonds, unless anyone can find an earlier reference, this is the very first eclipse at which what we know now as Baily's Beads were liked to <diamonds>. Ref Bob Morris 04/01 SEML

(Continued on page 7)

SECalendar

April 17, 1912 In 1912 there was one Total Annular Eclipse on 17 April, but as well a total solar eclipse on 10 October 1912. Ref. More Mathematical Astronomical Morsels by Jean Meeus; Willmann-Bell, 2002.

April 18, 0497 Marcellini: "Comitic V.C. Chronicon" "(A. C. 497.) Ind. V, consulship of Anastasius Aug. solar eclipse happened." The Annals of Ulster, The Chronicon Scotorum, The Annals of Tigernach (Ireland) AU496, CS493, AT497: "An eclipse of the sun was visible." Ref. SENL 0402.

April 18, 1955 Death of Albert Einstein (1879-1955), American theoretical physicist, mainly known for his relativity. (Ref. Rc 1999)

April 19, 1064 The first solar eclipse in russian chronicles (letopises), described together with famous apparition of comet Halley (of Hastings). "The year of 6573 [Byzantian era: 5508 should be subtracted, but the beginning of the year could be March or September] ... These times there was a portent on the East: the star great, having beams as bloody, rising from evening after sunset and was for 7 days ... Before this time and the sun changed, and was not bright but as a crescent it was." Ref SENL0402.

April 19, 1882 Minor Planet (225) Henrietta Discovered 1882 April 19 by J. Palisa at Vienna. Named in honor of the wife of the French astronomer Pierre J. C. Janssen (1824-1907), pioneer of solar spectroscopy and director of the Meudon Observatory. (H 27) Named (BAJ Circ., No. 213 (1883)) by P. J. C. Janssen. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 19, 1989 Warren de la Rue (1815-1889) died in London. Warren de la Rue (1815-1889), UK and Angelo Secchi (1818-1878), Italy, use photography during a solar eclipse in Spain to demonstrate that prominences (and hence at least that region of the corona) are part of the Sun, not light scattered by the Earth's atmosphere or the edge of the Moon, because the corona looks the same from sides 250 miles apart. (Ref. Rc 1999). January 15, 1815 born in Guernsey UK as oldest son of Thomas de la Rue, a printer. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

April 19, 1941 Minor planet (3892) Dezsö 1941 HD. Discovered 1941 April 19 by L. Oterma at Turku. Named in honor of the Hungarian astronomer Dezsö Loránt, an old friend of the discoverer, founder of the Observatory for Solar Physics in Debrecen and its director for many years. (M 18454) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 21, 1697 Of the 14 summits, higher then 8000 meter, this total solar eclipse is visible on 7: Mount Everest, Lothse, Makalu, Cho Oyu, Dhaulagiri, Manaslu, and Annapurna.

April 23, 1984 Minor planet (4478) Blanco 1984 HG1. Discovered 1984 April 23 by W. Ferreri at La Silla. Named in honor of Carlo Blanco, professor of astronomy at Catania University. Known for his intense activity in the observation and analysis of the mutual eclipses of the major satellites of Jupiter and Saturn, he is also involved in international campaigns devoted to observations of minor planets and the Pluto-Charon system. Furthermore, he has contributed to the study of solar-type stellar activity, in particular to analyses of stellar chromospheres and coronas. (M 17224) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 24, 1932 Minor Planet (1862) Apollo 1932 HA. Discovered 1932 April 24 by K. Reinmuth at Heidelberg. This object is named for the god of the Sun, child of Zeus and Leto {see planets (5731) and (68)}. (M 3758) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 24, 1967 Images of Surveyor 3 have been made of the 24 April 1967 lunar eclipse. This was a lunar eclipse across East Asia, Australia and the Pacific. Surveyor 3 made unusual views of a lunar eclipse: A total solar eclipse as seen from the moon. (Ref. OE by R, S, 1995). The crew of Apollo 12 visited Surveyor III in 1969. They brought back the Streptococcus mitis bacterium which was 31 months on the moon. Surveyor III camera system operated by having a TV camera aim up through a tube to a rotating mirror, which can be turned by radio command on Earth. Because the spacecraft tilted, a view of the earth was visible (which was not foreseen). The lunar eclipse of 24 April 1967 was video filmed. Surveyor III, and Jet Propulsion Lab scientists saw a beautiful scintillating ring of sunlight, refracted through the Earth's atmosphere. Very colorful and splendid. The halo was broken into beads. These beads have been measured by filters and their colors plotted on a chromatically diagram. Temperature took a plunge from

(Continued on page 8)

SECalendar

100 Fahrenheit to - 150 Fahrenheit (minus). There was another eclipse of the sun by the Earth on October 18, 1967 and Surveyor V was functioning then. Unfortunately, the mirror could not be tilted to see the Earth, although temperature measurements were obtained. Apollo 12 also brought back its TV mirror, the first human artifact to catch light from a lunar eclipse on the moon, to its makers on Earth. (Ref. S, LE O 1943-1993, FG)

April 25, 0822 <C'hang-ch'ing reign period, 2nd year, 4th month, day hsin-yu. The first day of the month. The Sun was eclipsed> Chiu-t'ang-shu, chap36 (Ref. PG 3/99) This eclipse was also visible on 4 of the 14 summits, higher than 8000 meter: Mount Everest, Lhotse, Makalu, and Cho Oyu. Ref. PA 06/00.

April 25, 1890 Birth of George van den Bergh in Oss, The Netherlands. Famous for his Saros cycle. George van den Bergh passed away 3 October 1966.

April 25, 1979 Minor planet (3885) Bogorodskij 1979 HG5. Discovered 1979 April 25 by N. S. Chernykh at Nauchnyj. Named in memory of Aleksandr Fyodorovich Bogorodskij (1907-1984), Soviet astrophysicist, director of the Astronomical Observatory of Kiev University, well known for his works on Einsteinian gravitation, solar physics and planetary nebulae. (M 19693) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

April 26, 1957 (Sir) Patrick Alfred Caldwell Moore launched his first program, the longest running show on television <The Sky at Night>. He is host of the program without a break. He observed many solar eclipses and he showed them many times in his program. (Ref. A-S 3/98). He observed his first total solar eclipse in 1954.

April 27, 1943 No solar eclipse related item on this day? Although, the birthday of Pat Totten, eclipse chaser and partner of Eclipse Guru MrEclipse Fred Espenak.

April 28, 1774 Birth of Francis Baily (1774-1844) in Newbury, Berkshire, British astronomer and Co-founder of the Royal Astronomical Society. Baily's beads have been named to him although Edmond Halley (1656-1742 or 1743) did notice them before. Baily studied the phenomenon more in detail. (Ref. Rc 1999). Died in London 30 August 1844. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

April 29, 1921 Birth of Cornelis de Jager, Dutch astronomer. Studied the Sun and solar eclipses. Still active astronomer and gives many lectures.

April 29, 2014 Next annular solar eclipse which will not be a central solar eclipse on earth. This limit solar eclipse is like the one of 3 October 2043 a miss, the two only exceptions next century. The central line of the solar eclipse will not be visible on earth. Both central lines are near the South Pole. This century there were as well two misses, 18 March 1950 near the North Pole and 30 April 1957 near the South Pole. The value of Gamma for the April 29, 2014 eclipse will be (to 3 significant figures) exactly equal to minus 1.000 (-1.000). This is fairly rare. Following solar eclipses that have a value of Gamma equal to 1.000 (both positive and negative) at maximum eclipse are -1339 Jul 03 (A-), -1320 Jun 04 (T+), -0869 Sep 25 (A+), -0196 Feb 01 (P), 2014 Apr 29 (A-), 2507 Apr 13 (A-) and 2662 Jan 12 (A+). (Ref. SLK 6/99 and Michael Gill 4/01).

April 30, -0462 (463 BC) In his book, Les Eclipses de Soleil, M.G. Bigourdan mentioned four eclipse comets. Besides the ones of 418, 1882 and 1893, he notes that Posidonius did observe a comet during the eclipse in -462. No other references have been found.

April 30, -0462 (463 BC) "Beam of the Sun! O thou that seest from afar, what wilt thou be devising? O mother of mine eyes! O star supreme, reft from us in the daytime! Why has thou perplexed the power of man and the way of wisdom by rushing forth on a darksome track? Art thou bringing a sign of some war, or wasting of produce, or an unspeakably violent snow-storm, or fatal faction, or again, some overflowing of the sea on the plain, or frost to bind the earth, or heat of the south wind streaming with raging rain? Or wilt thou, by deluging the land, cause the race of men to begin anew? I in no wise lament whate'er I shall suffer with the rest!" "God can cause unsullied light to spring out of black night. He can also shroud in a dark cloud of gloom the pure light of day" Both these quotations probably refer to the solar eclipse of 30 April 463 BC, which was nearly total at Thebes. Pinder (Greek poet) Ninth Paean, addressed to the Thebans. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, page 344, and, in part, in Encyclopedia Britannica CD 98. Ref. FE 01/01.

(Continued on page 9)

SECalendar

April 30, 0059 Simultaneous eclipse in Italy and Armenia: Pliny, "Natural History", Pliny, II, 180, LCL, v.330. "An eclipse of the sun that occurred on April 30 in the consulship of Vipstanus and Fonteius a few years ago was visible in Campania between 1 and 2 p.m. but was reported by Corbulo commanding in Armenia as observed between 4 and 5: this was because the curve of the globe discloses and hides different phenomena for different localities." Tacitus, "The Annals", XIV, 12 "There occurred too a thick succession of portents, which meant nothing. A woman gave birth to a snake, and another was killed by a thunderbolt in her husband's embrace. Then the sun was suddenly darkened and the fourteen districts of the city were struck by lightning. All this happened quite without any providential design; so much so, that for many subsequent years Nero prolonged his reign and his crimes." Tacitus, "The Annals", XIII, 41 "Corbulo then encamped on the spot, and considered whether he should push on his legions without their baggage to Artaxata and blockade the city, on which, he supposed, Tiridates had fallen back. [...] Then too there was a wonderful occurrence, almost a divine interposition. While the whole space outside the town, up to its buildings, was bright with sunlight, the enclosure within the walls was suddenly shrouded in a black cloud, seamed with lightning-flashes, and thus the city was thought to be given up to destruction, as if heaven was wroth against it." Cassius Dio, Roman History, LXII, 16, LCL, Translation by Earnest Cary "Nevertheless, in the midst of the sacrifices that were offered in Agrippina's honour in pursuance of a decree, the sun suffered a total eclipse and the stars could be seen." Ref. SENL 0402.

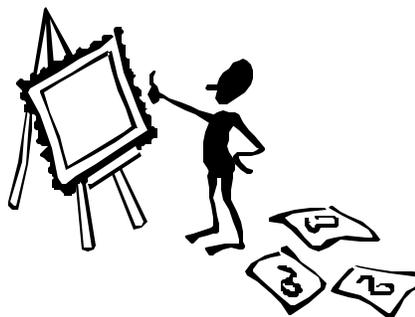
and ... keep those solar eclipse related messages coming ...

Best regards,

Patrick and Joanne

solareclipsewebpages@btopenworld.com

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



SECalendar April - van den Bergh

Date: Tue, 30 Mar 2004 From: "Jean Meeus" To: "INTERNET:SOLARECLIPSES@AULA.COM"

< Birth of George van den Bergh in Oss, The Netherlands. Famous for his Saros cycle.

Actually, van den Bergh was famous for his *Inex* cycle. This is a period of 358 lunations, or 29 years minus 20 days.

Although van den Bergh did much work about the Saros, the latter period was already known by the Babylonians. Jean Meeus

SECalendar April - Titanic

Date: Tue, 30 Mar 2004 From: "Bob Morris" To: "Patrick Poitevin"

Patrick: Titanic went down in the early morning of the 15th. In Europe, the first newspapers to have news were those of the 16th. Thus, people were out and about on the morning of the 17th seeking information about Titanic and watching the eclipse. Trafalgar Square in London was around the corner from the White Star offices.

Since the combined population of London and Paris in 1912 was perhaps twice that of New York in 1925, one can argue that even as of 1925, the 1912 eclipse was still the most watched in history.

The big question is, when, after 1925, was there an eclipse passing through or near a large area with more than about two million people? I don't know the answer. Bob



SECalendar

SECalendar April - Bob Morris

Date: Thu, 1 Apr 2004 From: "Bob Morris" To: "Patrick Poitevin"

Patrick: Since you are filling some "vacancies" with birthdays of SEML members (e.g., Pat Totten), here's a "proposal" for next year.

April 7, 1942 Birthday of professor, eclipse chaser, and eclipse historian Bob Morris. Bob has written 2-page, 3-page plus cover, and 4-page plus cover eclipse articles for Ottawa's "Citizen's Weekly" about these eclipses: April 17, 1912 (Paris, London, and "Titanic"); Jan. 24, 1925 (New York "diamond ring"); Feb. 15, 1961 (in film "Barrabas"); June 30, 1973 ("Concorde, 74 minutes totality"); and August 11, 1999 (Europe/Asia). Bob was on-site on the Athens-Sounion road for one of the least-observed eclipses of the 20th century, the May 20, 1966 "broken-ring" eclipse, with his photos of the "diamond necklace" phase appearing in Sky & Telescope.

SEDates

SEC2004 Attendees

Dear All, Only 5 months to go. The international solar eclipse conference (SEC2004) will take place 20 to 22 August in the Open University of Milton Keynes (UK).

Countries so far attending (alphabetical): Belgium, Canada, Czech Republic, Denmark, France, Germany, Iran, Ireland, Italy, Norway, Portugal, Romania, Slovakia, South Africa, Switzerland, The Netherlands, UK, USA

Register now. Only registered delegates can enter and attend the conference. Seats are limited.

General WebPages

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

SEC2004 WebPages

http://solareclipsewebpages.users.btopenworld.com/SEC_files/SEC2004.html

SEC2004 Preliminary Program

http://solareclipsewebpages.users.btopenworld.com/SEC_files/SEC2004Program.html

SEC2004 Preliminary Program Friday 20 August

http://solareclipsewebpages.users.btopenworld.com/SEC_files/Friday.PDF

SEC2004 Preliminary Program Saturday 21 August

http://solareclipsewebpages.users.btopenworld.com/SEC_files/Saturday.PDF

SEC2004 Preliminary Program Sunday 22 August

http://solareclipsewebpages.users.btopenworld.com/SEC_files/Sunday.PDF

SEC2004 Posters

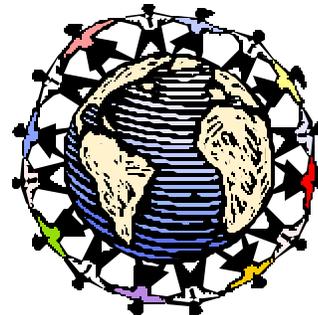
http://solareclipsewebpages.users.btopenworld.com/SEC_files/PostersSEC2004.PDF

SEC2004 Sponsors

http://solareclipsewebpages.users.btopenworld.com/SEC_files/SponsorsSEC2004.PDF

SEC2004 Costs with entrance fees and meals

http://solareclipsewebpages.users.btopenworld.com/SEC_files/SEC2004FEES.html



SEScannings

SENL March Index

Dear all, Please find herewith the Index of the March 2004 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 solareclipsewebpagesSENL200404@btopenworld.com

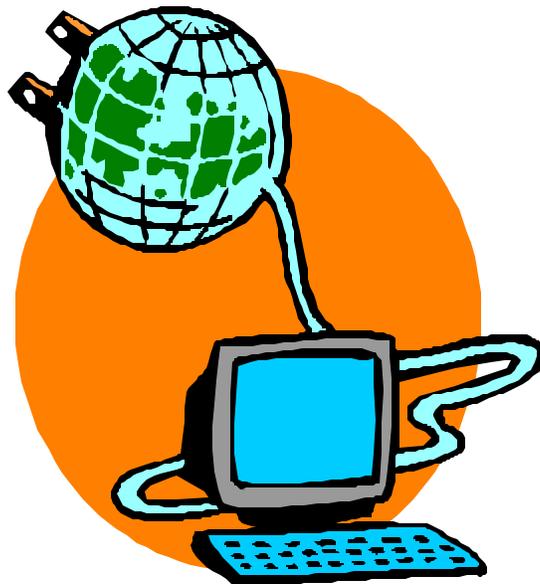
And ... keep those solar eclipse related messages coming ...

Best Regards,

Patrick and Joanne

solareclipsewebpagesSENL200404@btopenworld.com

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



SETalk

Feb 26 in snowy cold Canada

From: "Odille Esmonde-Morgan& Warwick Lawson" To: SOLARECLIPSESEN200404AULA.COM Date: Mon, 1 Mar 2004

One of the most amazing things I saw during the eclipse in SA in 2002 was all the cars going along (many with headlights on) without stopping. There had been so much publicity, they must have known what was going on, but they just drove past the sight of a lifetime! (Maybe they were afraid of hurting their eyes - there was some scaremongering in the press.)

Folks are queer sometimes! Odille Esmonde-Morgan Terranora, northern NSW, Australia

From: "Christiaan"

Just curious.. was this SA as in South Africa or South Australia? Regards, Christiaan.

From: "Peter Tiedt"

That would be South Australia

South Africans would NEVER do that ;-)

Perhaps the ones that emigrated to Oz would tho

From: "Odille Esmonde-Morgan& Warwick Lawson"

South Australia Odille Esmonde-Morgan Terranora, Australia

**Delta T**

Date: Thu, 4 Mar 2004 From: "Jean Meeus"

The difference Delta T between Dynamical Time and Universal Time was

64.57 seconds on 2004 Jan 1,
64.59 seconds on 2004 Feb 1.

Jean Meeus

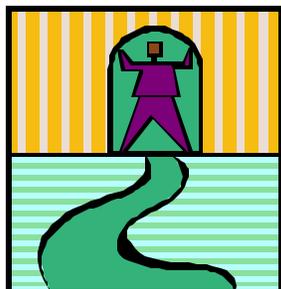
**Eclipse pathwidth 31/05/2003**

Date: Sun, 29 Feb 2004 From: "Familie Van der Putten" To: VVSSSEN200404LISTSERV.CC.KULEUVEN.AC.BE

Een vraagje voor de rekenaars. In de Espenak tabellen voor 31 mei jl. staan bij greatest eclipse Northern limit (64N 28W) en Southern limit (72N 8W). Die locaties liggen 11 bolgraden uit elkaar, aan 111 km/graad. Ik bereken 1213.4 km pathwidth. Bij Espenak staat een pathwidth van 4519.6 km aangegeven. Wat is hier fout? Frank Van der Putten Mechelen-Leest

From: "Frank en Tania"

Dag Frank, De antumbrale schaduw (het was een ringvormige verduistering) is zoals je weet niet altijd even rond. Door projectie op de aardbol ontstaat er een ellipsvormige schaduwvlek. Die is niet alleen in noord-zuidwaartse richting uitgerekt, maar ook in oost-westelijke richting. Zoals je kan zien liggen de noord- en zuidpunten van de ellips tijdens de maximum fase 20 lengtegraden uit elkaar (8W - 28W). Wanneer je de lengte van de grote as van de ellips gaat meten, kom je dus uit op een veel groter getal dan jouw uitkomst, die enkel de breedte van het pad langs de noord-zuidrichting meet. Frank



SETalk

**From: "Arie Nagel"**

ook maar eens een zon-opname gemaakt op 29-02-04 met Televue Genesis en Nikon 995 mooie sinaasappel :-)
<http://home.hetnet.nl/~astronet/ZON5081a.jpg> arie nagel

Transient lunar and solar phenomena during eclipses

To: solareclipsewebpagesSENL200404btopenworld.com From: astronomy-SENL200404rocketmail.com Date: Wed, 17 Mar 2004

To SENL: Can anyone help me with my collection of transient lunar and solar phenomena during eclipses. Especially: 1973 over Chad, and anything else you know about. I've collect about 50...I'd very well like to add to this...HEIP please...I'm serious and appreciate you help. Michael Roertson Astro Data



SETalk

QF2901 - A Stratospheric Eclipse?

Date: Fri, 5 Mar 2004 From: "Michael Gill" To: solareclipsewebpages@SENL200404@btopenworld.com

Hi Patrick, Regarding the QF2901 Qantas flight over Antarctica:

I have had some correspondence with Dr Andrew Klekociuk about this flight. Basically, I wondered if our aircraft might have observed the eclipse from inside the stratosphere.

Forwarded (with permission) is Dr Klekociuk's reply with supporting data and attachments. Perhaps this might be suitable for a future SENL? Cheers, Michael

Forwarded Message Subject: RE: QF2901 Eclipse Flight - A Query... Date: Thu, 4 Mar 2004 From: "Andrew Klekociuk" To: "Michael Gill" CC: "Glenn Schneider"

Plain Text Attachment Hi Michael [and to Glenn Schneider for info] Good to hear from you, and thanks for your interesting question (appended below).

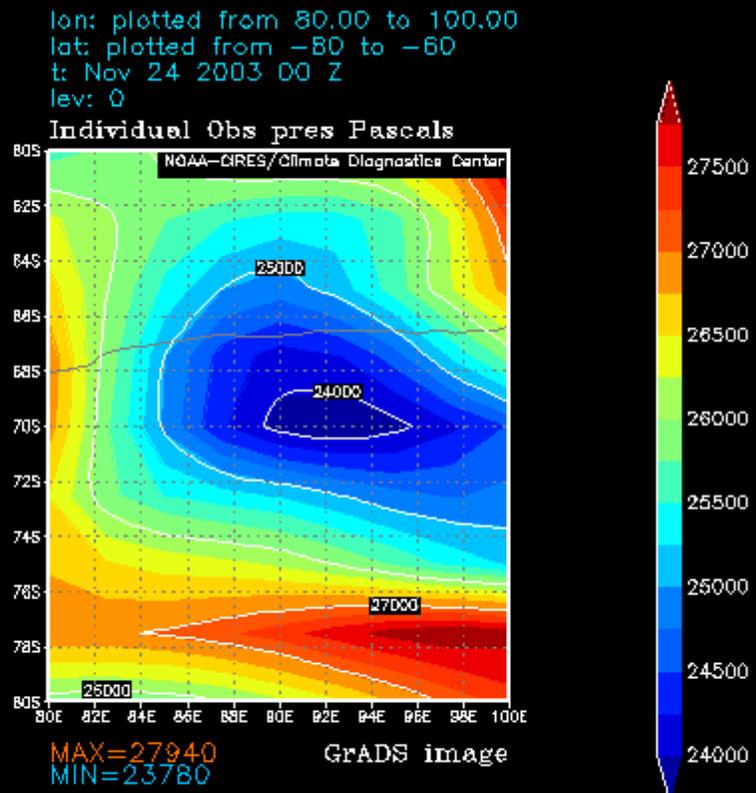
Yes - the tropopause height does vary with latitude and season. The definition of the tropopause height that is normally used is as follows;

Tropopause: The boundary layer between the troposphere and stratosphere, where an abrupt change in temperature lapse rate usually occurs. It is defined as the lowest level at which the lapse rate decreases to $2^{\circ}\text{C km}^{-1}$ or less, provided that the average lapse rate between this level and all higher levels within 2 km does not exceed $2^{\circ}\text{C km}^{-1}$. Occasionally, a second tropopause may be found if the lapse rate above the first tropopause exceeds $3^{\circ}\text{C km}^{-1}$. [from <http://nsidc.org/arcticmet/glossary/tropopause.html>]

I've attached a plot of temperature vs pressure and altitude for eclipse day (20031123_amsu_tse.pdf). The black line is actual data for 70S, 93E (approximate position of our aircraft at totality) from the AMSU-A sounder on the NOAA polar orbiting weather satellites interpolated for 1400UT. The sounders (on NOAA15, 16, 17) measure temperature vs pressure. The altitude scale on the right hand side is estimated from the pressure and temperature data using what is called the 'hypsometric relation' (the Perfect Gas Law under hydrostatic equilibrium) - it should be OK to a few hundred metres at low altitudes, and a few km at the highest altitudes. The red line is the MSISE90 atmospheric model prediction, and the green curve is a radiosonde measurement at Davis (69S, 78E) starting at 1126UT.

The other PDF file (20031123_amsu_lapse.pdf) is a plot of the lapse rate (or temperature gradient) vs altitude from the AMSU data (BTW; I've used numerical differentiation with 3-point Lagrangian interpolation). The plot shows the temperature inversion near the surface (positive values of the lapse rate). The lapse rate in the troposphere is normally -5°C/km . It looks like the tropopause is between about 8 and 10km, based on the definition.

A word of caution - the AMSU sounders, while nadir looking, have relatively poor vertical resolution (effectively 1-2km of smoothing). So the actual tropopause location will be smeared out a bit.



QF2901 A Stratospheric Eclipse tropopause_map_20031124_0000

SETalk

I've also included a couple of plots ('tropopause_map_...png') from NCEP Reanalysis Data at NOAA's Climate Diagnostics Center (http://www.cdc.noaa.gov/cgi-bin/DataAccess.pl?DB_dataset=NCEP+Reanalysis+Tropopause+Level&DB_variable=Pressure&DB_statistic=Individual+Obs&DB_tid=5653&DB_did=5&DB_vid=50). This analysis is based on AMSU data, as well as balloon-borne radiosondes (eg Davis) and surface measurements. For 23/12UT, the tropopause pressure is given as about 260hPa (26000Pa) for our position, and it is a bit lower (~240hPa) at 24/00UT (perhaps due to the cooling of the atmosphere by the eclipse). This equates to roughly 10km altitude.

So in summary, it seems we were flying pretty close to the tropopause, and possibly (just) inside the stratosphere!

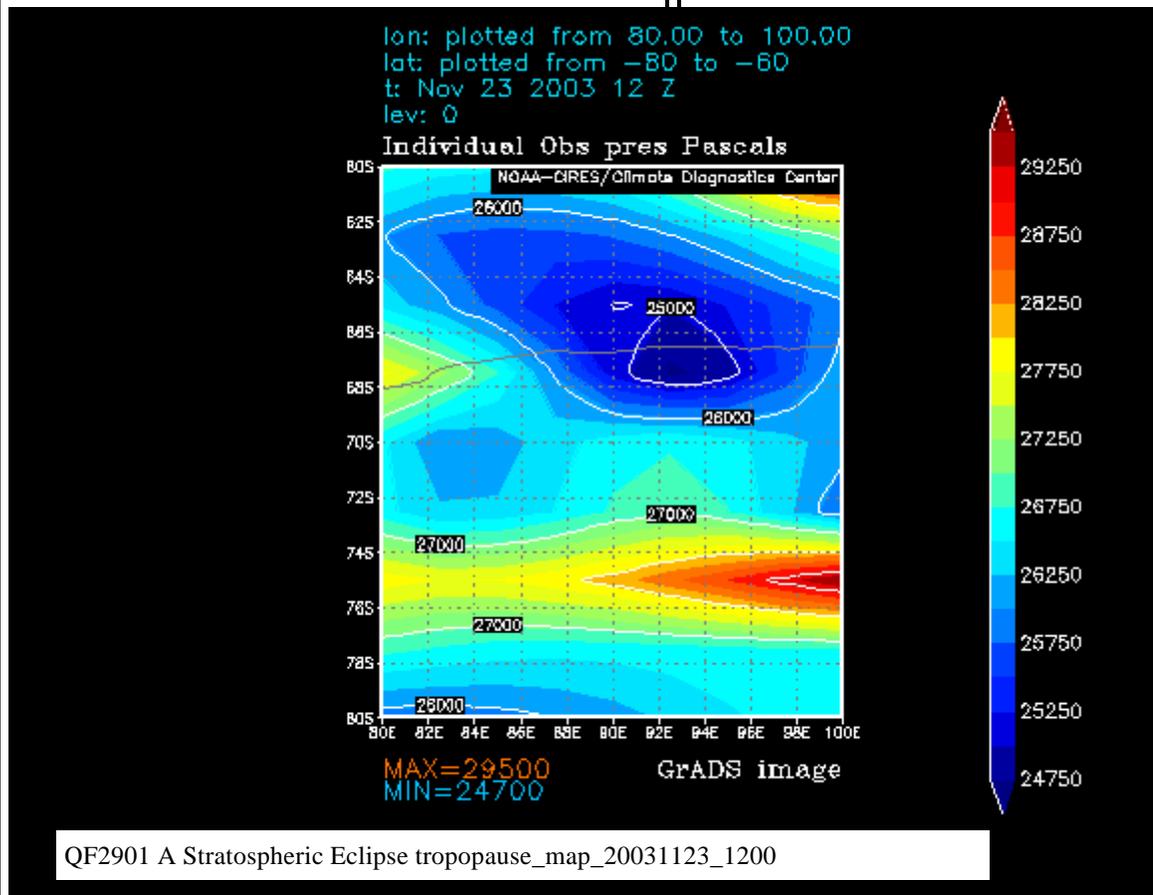
Here's the raw AMSU data for info.:

Pressure (hPa):

```
1000.0000    950.00000    9 2 0 . 0 0 0 0 0
      850.00000    780.00000    7 0 0 . 0 0 0 0 0
      670.00000
```

```
620.00000    570.00000    500.00000    4 7 5 . 0 0 0 0 0
      430.00000    400.00000    350.00000
300.00000    250.00000    200.00000    1 5 0 . 0 0 0 0 0
      135.00000    115.00000    100.00000
85.000000    70.000000    60.000000    5 0 . 0 0 0 0 0 0
      30.000000    25.000000    20.000000
15.000000    10.000000    7.000000    5 . 0 0 0 0 0 0 0
      4.0000000    3.0000000    2.0000000
1.5000000    1.0000000    0.5000000    0 . 2 0 0 0 0 0 0
      0.10000000
Altitude (km):
0.000000    0.411574    0.657152    1 . 2 5 9 1 3
      1.90583 2.70801 3.02860 3.59024
4.19044 5.10816 5.46184 6.13975 6.62582 7.51027 8 . 5 1 0 3 7
      9.67986 11.1037
12.9570 13.6454 14.7046 15.6373 16.7296 18.0411 1 9 . 0 8 5 1
      20.3223 23.8093
25.0652 26.6143 28.6362 31.5516
      34.2041 36.7959 38.5626 40.8916 44.2514 4 6 . 6 6 4 1
      50.0558 55.7154
62.8242 67.8745
Temperature (K):
242.329 239.286 238.838 238.503 240.668 247.023 2 4 5 . 7 6 3
      243.375 240.131
```

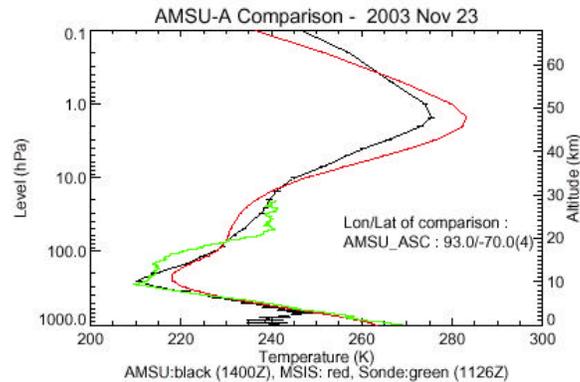
```
235.392 2 3 3 . 3 7 1
      2 2 9 . 0 9 2
      2 2 6 . 0 0 9
      2 2 0 . 2 1 9
      2 1 4 . 3 1 2
      2 1 0 . 6 0 1
      2 1 4 . 1 9 6
      220.862
222.937 2 2 4 . 8 6 3
      2 2 7 . 6 5 6
      2 2 9 . 1 7 2
      2 3 0 . 5 8 4
      2 3 1 . 7 6 2
      2 3 3 . 9 5 4
      2 3 7 . 8 6 0
      238.899
239.592 2 4 1 . 3 4 2
      245.053
      2 5 1 . 4 3 8
      2 5 6 . 6 0 2
      2 6 0 . 2 4 1
      2 6 5 . 9 5 9
      2 7 2 . 8 8 3
      2 7 5 . 2 8 3
      2 7 3 . 9 6 3
      266.471
257.080 246.633
```



Please let me know if

(Continued on page 16)

SETalk



you need any further information. Cheers Andrew Dr. Andrew Klekociuk Email: andrew.klekociuk@senl200404aad.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>

> Original Message--From: Michael Gill Sent: Thursday, 4 March 2004 04:23 To: Andrew Klekociuk Subject: QF2901 Eclipse Flight - A Query...

> Dear Andrew, We met, and had a brief conversation, on QF2901 over Antarctica last November.

> I was wondering if you could answer a query that I have about that flight?

> I gather that the boundary between the troposphere and the stratosphere lies above the levels where commercial jetliners (except Concorde) fly. However, is this boundary fixed or is it latitude-dependant?

> It occurred to me that if we flew at 35,000 feet (10.67km) at latitude 70-degrees south, might we have observed the eclipse from the stratosphere?

> Any feedback you can give would be appreciated.

> Cheers and happy eclipse-chasing, Michael Gill

SETalk

The first full solar eclipse by Phobos ...

From: "Daniel Fischer" Date: Thu, 11 Mar 2004 To: SOLARECLIPSES-SENL200404aula.com

... can be seen at http://origin.mars5.jpl.nasa.gov/gallery/all/opportunity_p045.html - the annular phase was missed, but the pictures are still quite impressive! Daniel

The first full solar eclipse by Phobos 1P132176252ES-F05A6P2670R8M1-THM



The first full solar eclipse by Phobos 1P132176262ES-F05A6P2670R8M1-THM

**Eclipses or transits?**

Date: Wed, 10 Mar 2004 From: "Jean Meeus" To: "INTERNET:SOLARECLIPSESSENL200404AULA.COM"

When, as seen from the surface of Mars, Phobos or Deimos passes over the solar disc, will we call this an eclipse or a transit?

As seen from the Earth, on June 8 next there will indeed be a transit of Venus. Nobody would call this an eclipse.

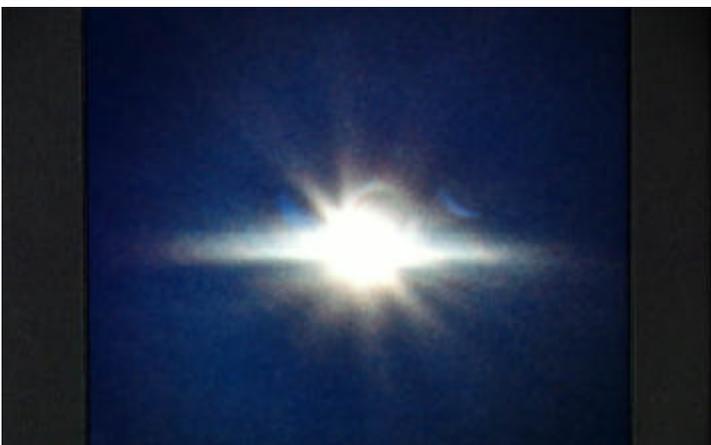
But Venus is another planet, not a satellite of the Earth. On the contrary, Phobos and Deimos are satellites of Mars.

If their passages over the Sun, as seen from Mars' surface, are called transits, where will we put the limit? Certainly, as seen from Jupiter, the similar passages of the four Galilean satellites are called eclipses; they even are total eclipses.

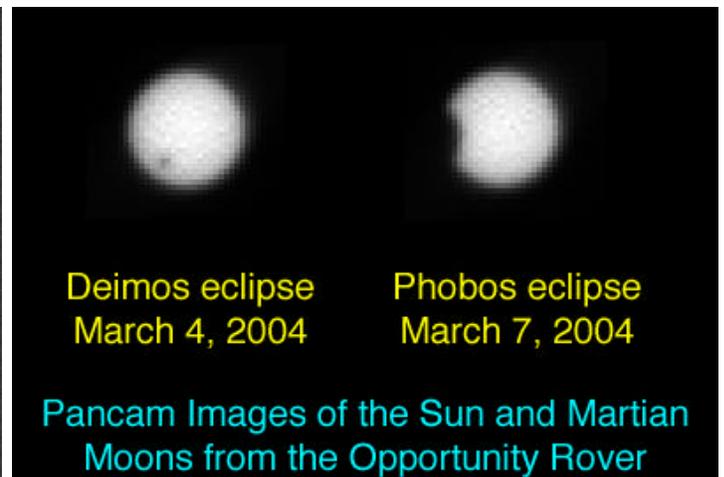
So what? Solar eclipses by Io or Callisto, but transits of Phobos and Deimos? Jean Meeus

From: "Dale Ireland"

Many satellites of the Earth pass in front of the Sun and are observed by satellite enthusiasts on a regular basis. These are never referred to as eclipses but as transits. I think that the fact there is no possibility of total coverage precludes the use of the term eclipse. In "common usage" (not in our specialized group) eclipse and total eclipse are almost synonymous. Partial eclipses are always referred to as partial while total eclipses are often just called eclipses. The use of the term eclipse by NASA in this case is a bit of media hype. If you call it a transit you are certainly correct, if you call it an eclipse it is very debatable and exaggerated. Different dictionaries define eclipse differently but most refer to the "obscuration" of the Sun by the Moon or the Moon by the earth's shadow and "similar" events on other planets. The term "obscuration" itself is ill-defined but tends to refer to a dimming to such a degree as to make something difficult to distinguish. Of course this is all "English", maybe other languages have other definitions. Dale



eclipses from mars JSC collection Schneider message S66-63415



Deimos eclipse
March 4, 2004

Phobos eclipse
March 7, 2004

Pancam Images of the Sun and Martian Moons from the Opportunity Rover

eclipses from mars MERB_First_Transits-B043R1

SETalk

Coming soon: solar eclipse photos from Mars

Date: Fri, 05 Mar 2004 From: "Fred Bruenjes" To: SOLARECLIPSESEN200404AULA.COM

Images of the first solar eclipse ever observed from Mars have been posted on the JPL website:

http://marsrovers.jpl.nasa.gov/gallery/all/opportunity_p039.html

Deimos is visible as a small dot near the lower left edge of the limb. I have enlarged the frames and combined them into an animation:

http://www.moonglow.net/eclipse/merb_deimos.gif

It looks like my prediction was a little off; we got an annular eclipse instead of a partial. Not bad for my first try! The Phobos eclipses coming in a few days should be much more impressive. Fred Bruenjes

From: eclipseclatSEN200404comcast.net

Dear Fred (Bruenjes); That was very, very cool. Thank you so much!! Phobos should be awesome. Ray Brooks

From: KCStarguySEN200404aol.com

That is great. The animate looks like what might appear if you were looking closeup to a distant sun that has an extrasolar planet orbiting about it that sweeps in front of a star. Dr. Eric Flescher (kcstarguySEN200404aol.com), Olathe, KS. USA

From: "Michael Gill"

The JPL site has a nice comparison of a Deimos eclipse with a Phobos one:

http://marsrovers.jpl.nasa.gov/gallery/press/opportunity/20040308a/MERB_First_Transits-B043R1.jpg

Cheers, Michael Gill

From: mrkSEN200404iac.es

These are just the first in a series of images that will be taken of eclipses. Phobos was a rather small partial. Deimos is so small that you can hardly see it! Be patient and there will be much better images of Phobos, at least. Mark Kidger

From: Jay.M.PasachoffSEN200404williams.edu

THE FOLLOWING RELEASE WAS RECEIVED FROM NASA HEADQUARTERS, IN WASHINGTON, DC.

RELEASE: 04-085 - NASA ROVERS WATCHING SOLAR ECLIPSES BY MARS MOONS - NASA's Mars Exploration Rovers have become eclipse watchers.



SETalk

Though the Viking Landers in the 1970s observed the shadow of one Mars' two moons, Phobos, moving across the landscape, and Mars Pathfinder in 1997 observed Phobos emerge at night from the shadow of Mars, no previous mission has ever directly observed a moon pass in front of the sun from the surface of another world.

The current rovers began their eclipse-watching campaign this month. Opportunity's panoramic camera caught Mars' smaller moon, Deimos, as a speck crossing the disc of the sun on March 4. The same camera then captured an image of the larger moon, Phobos, grazing the edge of the sun's disc on March 7.

Rover controllers at NASA's Jet Propulsion Laboratory (JPL), Pasadena, Calif., are planning to use the panoramic cameras on both Opportunity and Spirit for several similar events in the next six weeks. Dr. Jim Bell of Cornell University, Ithaca, N.Y., lead scientist for those cameras, expects the most dramatic images may be the one of Phobos planned for March 10.

"Scientifically, we're interested in timing these events to possibly allow refinement of the orbits and orbital evolution of these natural satellites," Bell said. "It's also exciting, historic and just plain cool to be able to observe eclipses on another planet at all," he said.

Depending on the orientation of Phobos as it passes between the sun and the rovers, the images might also add new information about the elongated shape of that moon.

Phobos is about 27 kilometers long by about 18 kilometers across its smallest dimension (17 miles by 11 miles). Deimos' dimensions are about half as much, but the pair's difference in size as they appear from Mars' surface is even greater, because Phobos flies in a much lower orbit.

The rovers' panoramic cameras observe the sun nearly every martian day as a way to gain information about how Mars' atmosphere affects the sunlight. The challenge for the eclipse observations is in the timing. Deimos crosses the sun's disc in only about 50 to 60 seconds. Phobos moves even more quickly, crossing the sun in only 20 to 30 seconds.

Scientists use the term "transit" for an eclipse in which the intervening body covers only a fraction of the more-distant body. For example, from Earth, the planet Venus will be seen to transit the sun on June 8, for the first time since 1882. Transits of the sun by Mercury and transits of Jupiter by Jupiter's moons are more common observations from Earth.

>From Earth, our moon and the sun have the appearance of almost identically sized discs in the sky, so the moon almost exactly covers the sun during a total solar eclipse. Because Mars is farther from the sun than Earth is, the sun looks only about two-thirds as wide from Mars as it does from Earth. However, Mars' moons are so small that even Phobos covers only about half of the sun's disc during an eclipse seen from Mars.

JPL, a division of the California Institute of Technology in Pasadena, manages the Mars Exploration Rover project for NASA's Office of Space Science, Washington. Images and additional information about the project are available from JPL at:

Images of those two events are available online at: <http://marsrovers.jpl.nasa.gov/gallery/press/opportunity/20040308a.html>

<http://marsrovers.jpl.nasa.gov>

and from Cornell University at: <http://athena.cornell.edu>



From: "Dave Balch

eclipses on
mars

Has anyone figured out whether either rover will experience a total eclipse??

1P1316414
97ESF0544
P2666R8M
1-THM

From: "Dale Ireland"

Phobos was imaged yesterday, 7 March around 0200UT IAUC telegram below Dale Ireland

TRANSITS OF MARS I AND II J. Bell, Cornell University; M. Lemmon, Texas A&M University; and M. Wolff, Space Science Institute; and the Mars Exploration Rover 'Athena' Science Team, report the imaging of transits of Mars I (Phobos) and Mars II (Deimos) across the sun with the Pancam 1-cm f/20 binocular CCD camera (+ solar neutral-density 5 filter; passband 880 +/- 20 nm; exposure lengths 0.06 and 0.10 s, taken at 10-s intervals) onboard the 'Opportunity' Rover craft located on the planet's surface at longitude 354.47417 deg east and latitude 1.94828 deg south. This is apparently the first direct imaging of a natural-satellite transit from the surface of another planet. The sun is approximately 20 pixels in diameter on the images, with Mars I and II having apparent diameters of approximately 10-13 and 2 pixels, respectively. Mars II was already in transit when the first image was obtained on Mar. 4.12773 UT, was approximately at mid-transit on the Mar. 4.12785 image, and was between third and fourth contacts on the Mar. 4.12819 image. Mars I was possibly near first contact on the image of Mar. 7.11556, was near mid-transit on Mar. 7.11567, and was near fourth contact on Mar. 7.11579. (C) Copyright 2004 CBAT 2004 March 8 (8298) Daniel W. E. Green

(Continued on page 20)

SETalk

(Continued from page 19)

From : **eclipses on mars**
1P131641507ESF0544
 mrkSENL200404iac. **P2666R8M1-THM**
 es



You can't get a total with either satellite as their are both too small. Deimos is so small that it just looks like a large sun-spot on the disk (about 10% of the Sun's diameter). Phobos covers slightly more than half the diameter of the Sun, so it's a matter of argument whether you call that a transit (as the Rover team has) or an annular. Mark

From: "Glenn Schneider"

The very recent first solar eclipse imagery from Mars will earn its rightful place in eclipse history. The recent discussion of this event on SEML brought to mind the (to my mind) even more profound seminal observation of a TOTAL solar eclipse witnessed from space, the well celebrated 12 November 1966 event seen from Gemini XII. Pat has dutifully noted that in past November SECalendars in SENL. However, some may not know that the diamond ring photograph of the event witnessed by Lovell and Conrad taken during the mission is available through the JSC digital image archive:

<http://images.jsc.nasa.gov/luceneweb/fullimage.jsp?seleconditions=null&textsearch=Go&keywords=eclipse&pageno=1&photoId=S66-63415>

Out of context, given the quality of the image, some may perceive this as not a very memorable photograph (which may be why it has been so infrequently reproduced). But, it will always remain one of my favorites. What a view THAT must have been!

There is a wonderful account of the Gemini XII solar eclipse imaging plans on the NASA HQ PAO web server at:

<http://www.hq.nasa.gov/office/pao/History/SP-4203/ch15-5.htm> Cheers, -GS-

From: "Glenn Schneider"

Before others note the error, I had in my last posting of course meant Aldrin and Lovell! -GS-

From: ECLIPSECLATSENL200404comcast.net

Mark Kidger wrote: Has anyone figured out whether either rover will experience a total eclipse??

I discussed this last year. Total eclipses are not possible due

to the small angular diameter of each moon. But decent annular eclipses by Phobos do occur.

The Sun would appear 2/3 as large as what we normally see, about 20 minutes of arc, and Phobos (15.5 arc-minutes on the long axis) would appear 75% of the size of the Sun. Each partial phase of the eclipse would last about 14 seconds, and annularity itself would last about 4.75 seconds. Phobos has synchronous rotation (same face toward Mars) but I do not know the orientation of its 3 axes. If the narrowest axis made first contact then annularity would last about 7 seconds. These durations account for the 540-mph site speed on Mars' equator. Total duration of partials and annular 35 to 37 seconds. Raymond Brooks

From: "Darren Osborne"

Would it make any difference on the top of Mount Olympus - 24,000 ft up? I would guess you wouldn't get a total eclipse, but you may get a lot closer. Could be a Martian Eclipse chasers paradise! Darren

From: "Dale Ireland"

Shouldn't we be referring to these as transits? No one is calling the upcoming Venus transit an "eclipse". Dale

From: KCStarguySENL200404aol.com

There were actually 2 not one transit/eclipses from Mars. Here is the information and website Dr. Eric Flescher (kcstarguySENL200404aol.com), Olathe, KS. USA 7 total solar eclipses and counting: webmaster Eric's Black Sun Eclipse website - <<http://members.aol.com/kcstarguy/blacksun/eclipse.htm>. webmaster, Satori Astronomy website <<http://members.aol.com/kcstarguy/satoriastronomy/satoriastronomy.htm>>

OPPORTUNITY SEES PHOBOS AND DEIMOS Mar 9, 2004 - NASA's Mars rovers stopped looking down for a bit to watch the Sun. Specifically, they were looking to see Mars' two moons, Phobos and Deimos, make transits across the face of the Sun. Opportunity watched the smaller moon Deimos (14 km) pass in front of the Sun on March 4, and then larger Phobos (27 km long) make a transit on March 7 - in both cases, the transits lasted less than a minute. These images will help scientists better calculate the orbits and shape of the Martian moons.

http://www.universetoday.com/am/publish/opportunity_mars_transits.html?932004

From: "Francis Graham"

It would seem that the nodes for Phobos and Deimos would regress as they do for the Moon. Therefore, is it possible then that Phobos and Deimos would eclipse the sun (and each other) simultaneously?

SETalk

Concorde and June 30, 1973 eclipse

Date: Sat, 6 Mar 2004 From: "Bob Morris" To: "SE from LRM"

For Canadian list members, my story about Concorde 001 and the 1973 eclipse is in the Ottawa Citizen tomorrow (Sunday, March 7). It is three pages (no ads) plus cover.

74 minutes of totality!

Copies are going out to those who helped: Fred Espenak, Jean Meeus, Sheridan, Jay, Glenn, Jean Marc, and -- for the archives -- Patrick.

I interviewed five of the astronomers on board plus the pilot!

I am sorry that I cannot supply more copies since I have about 2 dozen people already on the list. If you know someone in a large Canadian city he might be able to get you a copy. Give them a phone call!

A special painting of Concorde against the eclipsed sun was done by Canada's top aircraft artist Don Connolly. It is on the cover, of the Citizen Weekly insert, perhaps 15x20".

Whether prints will become available I don't know.

I am submitting a revised version to Sky & Tel, with the hope that they may publish it and the painting.

For various reasons, it will not be on the web. Bob Morris

From: "Sheridan Williams"

Could someone scan the pages from the Ottawa Citizen and email a copy to me at: sheridanSENL200404clock-tower.com I have broadband so scanned images can be quite large. I'd suggest 300dpi. Thanks in anticipation

From: "Odille Esmonde-Morgan & Warwick Lawson"

This sounds great. Perhaps one of our Canadian members could scan it and put it on their site for a limited time, and send the URL to members? Odille Esmonde-Morgan Terranora, northern NSW, Australia <http://analog6.members.easyspace.com/analog6SENL200404ozemail.com.au>

From: "Dale Ireland"

You can download most articles from the Ottawa Citizen without a subscription for 7 days starting the DAY AFTER the article from their 7 day archive.

<http://www.canada.com/ottawa/ottawacitizen/news/archives/index.html>

The day of, and after 7 days you need a subscription, and for some select articles. Dale

From: KCStarguySENL200404aol.com

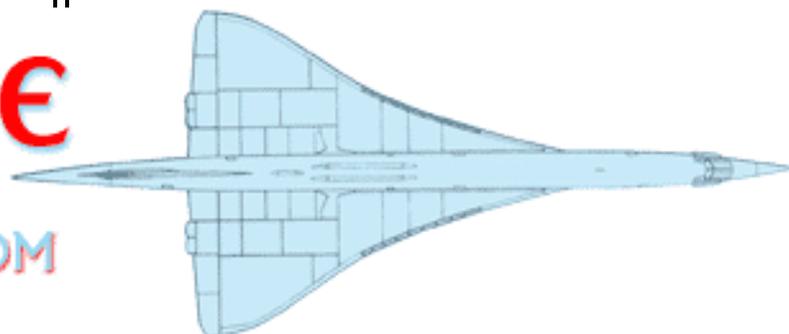
Greetings Daniel Thanks for the note about my 1973 account "Yoyage into Darkness- Nature's Greatest Spectacle." Yes it is still on my website now that I have fixed some bugs, uploaded files and more after doing some webpage fixing. The graphics now appear on the right of the 1973 account windows. If you don't have high speed, it will take a little longer time for graphics to appear. This 1973 account and the rest of my accounts are in the account pull down windows at the top of my main page. As always, these and the whole site are always being updated. I hope to place more graphics in the future and working things better. Thanks for the information Daniel. Questions, suggestions, ideas let me know.

From: "Daniel Fischer"

Dear Eric, thanks for the report - which is at <http://members.aol.com/kcstarguy/blacksun/1973eclipse.htm>

Concorde

WWW.CONCORDESST.COM



THE DEFINITIVE CONCORDE SITE ON THE INTERNET!

concorde headsmall

(Continued on page 22)

SETalk

while the menu "eclipse accounts" still leads to the incorrect URL

<http://members.aol.com/Blacksun/1973eclipse.htm> - thus the confusion. Regards, Daniel

From: "Robert B Slobins"

For those who are interested:

There are several artistic representations of the Concorde and the 30/6/1973 eclipse on stamps. Apparently, this was a big moment in this aircraft's history. These stamps are not listed as eclipse commemoratives issued by nations whose territory was touched by the moon's umbra.

One can try the American Topical Society for a provisional list. Remember that the ATS is a hobby group and may not categorise issues that finely (aviation or space, not aircraft) and may not have up-to-date lists, as this planet is buried in new stamp issues each year. You may then have to invest \$250 for a seven-volume set of the current Scotts catalog and do the research page by page. Have fun! cheers/rbs

From: "Wil Carton"

Not found! Neither with search word 'concorde', nor 'eclipse', nor 'bob morris' the item has been found by me in the indicated website. Could it have been printed in a weekend additional magazine of the newspaper, and consequently not have been stored in the digitally accessible archive? Wil Carton, HOLLAND.

From: "Dave Balch

I just called the Ottawa Citizen and ordered a copy of the March 7 edition... they will send it to me in the US (California) for under \$10 (US). Patrick... is it okay if I post the phone number??

From: "Bob Morris"

Unfortunately, the article is only available to full time subscribers. It is in a "Sunday supplement." Sorry, I can't do anything.

However, I will be submitting a more technical version to Sky & Tel.

And, at some point prints may be available of the Concorde's rendez-vous with the eclipse. Which is very nice!

The artist wishes to enter it into competition so at the moment it is not going to be up. Unfortunately, the relevant competitions are not till next year! Bob Morris

From: "Dave Balch

I just spoke with Nancy at the Ottawa Citizen... she said that back issues of the March 7 issue (article about the 1973 Concorde eclipse chase) were available and that you could order them from her.

He phone number is 613 596-3555

From: "Robert B Slobins"

Who will have the honour of writing the webmaster to correct the entry?

There will be longer totalities starting a hundred years from now, with the 2150 eclipse the longest at 7:29 or so.

However, I am sure that no one alive now will see seven minutes of totality again. cheers/rbs

From: "Mike Murphy"

On 9 Mar 2004 at 14:38, Robert B Slobins wrote: There are several artistic representations of the Concorde and the 30/6/1973 eclipse on stamps. Apparently, this was a big moment in this aircraft's history. These stamps are not listed as eclipse commemoratives issued by nations whose territory was touched by the moon's umbra.

For those wishing to find out more about Concorde's role in eclipse viewing I can recommend the [concordesst](http://concordesst.com) web site where many very knowledgeable and enthusiastic people hang out:

concorde dgfront



SETalk

A quick look at the site reveals the chronology of Concorde wherein it says:

"30th June: A solar eclipse, which scientists predicted would be the longest for 1,000 years, was witnessed aboard Concorde 001 (F-WTSS) by scientists from Britain, France and USA on a flight from Las Palmas, Canaries to Fort Lamy, Chad. Concorde 001 flew at 55,000 feet and its speed made the solar eclipse visible to the scientists continuously for 80 minutes."

see: <http://www.concordesst.com/> Clear skies - Mike in the UK

From: "Evan Zucker"

> > "30th June: A solar eclipse, which scientists predicted would be longest for 1,000 years, was witnessed aboard Concorde 001

Putting aside the question of when the 1973 eclipse duration would be exceeded in the future, presumably what this was meant to say was that it was the longest eclipse for the NEXT 1,000 years. There had been a longer eclipse in that very same saros 18 years before, in 1955. I believe the 1955 eclipse was the longest duration eclipse in that entire saros. To find a longer eclipse than 1955, you would have to go to a different saros. Evan Zucker

From: "Jean Meeus"

Concerning the total solar eclipse of 1973 June 30:

< "30th June: A solar eclipse, which scientists predicted would be the longest for 1,000 years, was witnessed aboard Concorde 001.

The longest for 1000 years?? Haha! if scientists said that, then surely they were not competent.

That total solar eclipse had a maximum duration of 7 minutes and 4 seconds. There will be longer total eclipses on 2150 June 25 (7m 14s), on 2168 July 5 (7m 26s), 2186 July 16 (7m 29s), 2204 July 27 (7m 22s), and a few other ones before the year 2900. Jean Meeus

From: "Dale Ireland"

At 80 minutes it was the longest eclipse in millions of years but they didn't want to overdo it in the statement.

From: "Jean-Paul GODARD"

For those who are interested and don't know about Martine TLOUZEAU's Eclipse Stamp collection...

Martine has a huge collection of eclipse related stamps, first day covers, commemorative envelopes, coins and notes. Martine is also a "Concorde Lovers" and remain an addict of "le bel oiseau" Have a look to Martine's collection at <http://MsEclipse.free.fr> Every Concorde+Eclipse stamp is pictured.

On 31th of May 2003, for the last commercial flight of Air France CONCORDE Martine had to choose between an Annular Eclipse in Scotland and the two last landings... <http://mapage.noos.fr/eclipses/030531/index.html> Martine is invited speaker at the next Solar Eclipse Conference (SEC2004) organised by Patrick Poitevin. http://solareclipsewebpages.users.btopenworld.com/SEC_files/SEC2004Program.html Cordialement,

From: "Bob Morris"

SETalk

73 minutes 54 seconds Bob Morris

From: "Robert B Slobins"

Fred:

> I don't expect to make the 2186 eclipse, but I'm already planning for the 2010 annular. Fred Espenak

You have to believe in reincarnation for 2186. ;-) cheers/rbs

From: "Fred Espenak"

Putting aside the question of when the 1973 eclipse duration would be exceeded in the future, presumably what this was meant to say was that it was the longest eclipse for the NEXT 1,000 years. There had been a longer eclipse in that very same saros 18 years before, in 1955. I believe the 1955 eclipse was the longest duration eclipse in that entire saros. To find a longer eclipse than 1955, you would have to go to a different saros.

For an 8,000 year catalog of long annular and total eclipses, see: <http://sunearth.gsfc.nasa.gov/eclipse/SEcatmax/SEcatmax.html>

Over the next 1000 years (2001-3000), the longest eclipses are:

Longest Total Solar Eclipse: 2186 Jul 16 Duration = 07m29s

Longest Annular Solar Eclipse: 2010 Jan 15 Duration = 11m08s

I don't expect to make the 2186 eclipse, but I'm already planning for the 2010 annular. Fred

From: Jay.M.Pasachoff@SENL200404williams.edu

Congratulations to Bob Morris for his Concorde article about the 1973 eclipse expeditions.

Four scientific articles based on Concorde eclipse articles are available on line through the Astrophysical Data System, <http://adswww.harvard.edu>, a free service.

You will find two articles from Astronomy and Astrophysics by Pierre Lena and colleagues: The Thermal Emission of the Dust Corona, during the Ecilpse of June 30, 1973 I by P. Lena, Y. Viala, J. Mondellini, D. Hall, T. W. McCurnin, A. Soufflot, C. Darpenigny, and J. Belbeoch; II by P. Lena, Y Viala, D. Yall, and A. Soufflot with the first describing the instrument and the flight. The first article refers to a paper in Nature and a paper in Applied Optics not listed in ADS.

The fourth, by F. H. Grover, about "Geophysical Effects of Concorde Solar Boom," doesn't deal with the eclipse.

Within ADS, go to "Search References" and then go to "Astronomy and Astrophysics." Put the keyword ("Concorde" is what I used) in the box and click on "Send Query." Different codes after the articles that come up show whether they have only an abstract (A) , a full text for printing, etc. Jay Pasachoff

More Fun

From: eclipseclat@SENL200404comcast.net To: SOLARECLIPSE@SENL200404aula.com Date: Sat, 06 Mar 2004

The opening and operative expression of my last piece was, "Let's have fun..." as this ultimately is the ulterior motivation no matter how seemingly serious one's effort. (All our machinations will evaporate with Earth when enveloped by Old Sol.)

In my original lighthearted vein, I offer that appulse is the propitious product of the renowned penchant of English to never be afraid

SETalk

or embarrassed to steal, corrupt, merge, transmogrify, invert, dovetail, invent, pervert, refine or borrow a word from any other to make English the planet's most utilitarian tongue. In this case crime pays and for which I am, once again, giddily guilty.

Curiously, the classic definition of appulse has nothing whatsoever to do with "driving towards", another benevolent bastardization of Latin by English. In fact, two bodies apparently approaching can be traveling in precisely opposite directions; and thus, I stand by my non-classic and more appropriate use of appulse. With those I offend, I empathize; to those I titivate, I welcome. (My empathy stems from rapped knuckles dispensed by the teacher for grammatical discretions.) Cheers to all Raymond Brooks

From: eclipseclatSENL200404comcast.net

Thank you most kindly, Jean.

Jean wrote: Maybe Raymond actually calculated his instant as Dyn.Time, not as > UT. In that case he is only six seconds off.

I was wrong by 59 seconds not 6. Thanks for the input. Now we all know when to celebrate. Clear skies and good photos to all. Raymond Brooks

From: DawarahulaSENL200404aol.com

You mean périgée isn't it ? It seem that we use it only for the moon; We get another word for others objects : "périhélie"
Best regards Khristophe

From: "Jean Meeus"

Yes, I mean périgée, with two accents, but in e-mails we should avoid accents because not everybody can read such characters correctly.

The word "périhélie" concerns the closest distance to the *Sun*, not to the Earth. In English that word is "perihelion". So we have the perihelion of a planet, an asteroid, or a comet.

But there is no word for the closest distance of a planet to the *Earth*. The closest distance of Mars to the Earth is simply "closest distance". As I wrote in a mail, in France the word "périgée" is used for this, so they write about the "périgée de Mars". But I don't like this, because Mars is not revolving around the Earth! Jean Meeus

Free! Copies of NASA's 2003, 2002 and 1998 eclipse bulletins

Date: Wed, 31 Mar 2004 To: SOLARECLIPSES-SENL200404AULA.COM From: "Fred Espenak"

Thanks to everyone who contacted me about ordering free copies of the 2003 NASA eclipse bulletin (predictions for both annular and total eclipses of 2003). If you ordered one or more copies, you should have received them by now. If not, please send another request to me.

I still have plenty of copies of the 2003 bulletin so let me repeat my offer.

I will mail copies of the 2003 bulletin to anyone who requests, postage free. You do not even need to send me an envelope. Perhaps you know a teacher or a planetarium who could use 10 or 20 copies for a lesson on eclipses?

Just email me off line (not on SEML) with your postal address and the number of copies of the 2003 bulletin which you would like to receive.

I also have plenty of copies of the 2002 bulletin (eclipse in Africa & Australia) as well as the 1998 bulletin (eclipse in South America and the Caribbean), so let me offer these as well.

I've got to make room in my office for the 2006 bulletin which I hope to publish in the second half of 2004. Thanks, - Fred Espenak

Full-silhouette solar eclipses

Date: Mon, 29 Mar 2004 From: "Jean Meeus" To: "INTERNET: SOLARECLIPSESENL200404AULA.COM"

Some time ago, Dr. Pasachoff asked me if there exist a collective name for the total and annular eclipses.

The expression "central eclipses" for these eclipses is incorrect. Although most total and annular eclipses are indeed central, some are not. For instance, the annular eclipse of 2014 April 29 will have no central line, so it is not a "central" eclipse.

I have now found that Prof.G. van den Bergh (1890-1966) used a better name: "full-silhouette" eclipses. In his work "Periodicity and Variation of Solar (and Lunar) Eclipses" (1955), vol.I, page 39, van den Bergh writes that full-silhouette eclipses are "those eclipses during which, from some places on Earth, the fukk silhouette of the Moon can be seen, standing out either against the disk of the Sun or against the corona".

In other words, annular, total, annular-total, non-central annular and non-central total eclipses are "full-silhouette" eclipses, as opposed to

SETalk

partial eclipses. Jean Meeus

From: "Bob Morris"

Even though van den Berg was from my undergraduate alma mater (U of Toronto), I think "full-silhouette" is somewhat clumsy.

A one-word descriptor is "tangential."

During any total, annular, annular-total, non-central annular and non-central total eclipses, at two instants (second and third contacts) the solar and lunar discs share a common tangent line. This does not happen during a partial eclipse. (At the edge of the path, second and third contacts merge.)

Since "full-silhouette" and "tangential" both require explanations, they are both flawed.

However, I'd argue, that "tangential" is a bit more elegant. :-) Bob Morris

From: "Glenn Schneider"

Circumferential Eclipse? -GS-

From: "Bob Morris"

Partial eclipses show broken circumferences. :-) LRM

From: "Glenn Schneider"

But circumferential has the meaning: (from Webster's):

\Cir*cum`fer*en`tial\, a. [LL. circumferentialis.] Pertaining to the circumference; encompassing; encircling; circuitous. --Parkhurst.

Alternativey, I suppose Circumambient:

\Cir`cum*am"bi*ent\, a. [Pref. circum + ambient.] Surrounding; inclosing or being on all sides; encompassing.

From: "Jean Meeus"

Bob Morris wrote: < However, I'd argue, that "tangential" is a bit more elegant. :-)

Sorry, but I don't think that "tangential" is a good term.

At a partial eclipse of magnitude zero (that is, just nothing is seen), the solar and lunar disks are tangent too! But here the tangency is external. So, should we say "internal tan-

gential" eclipses? I doubt that this is a better choice than "fully-silhouetted". Jean Meeus

From: "Bob Morris"

Partial eclipses of zero magnitude are a case to be considered two days from now, not today. Then we can list, for the next partial eclipse of zero magnitude, time of first contact and fourth contacts etc.

We can try to persuade Sky & Tel, to celebrate the next occurrence of a partial eclipse or zero magnitude in the month of April with a contest for best picture of the eclipse! LRM

From: Jay.M.PasachoffSENL200404williams.edu

I'm glad to see the correspondence that has followed my original request for a name for annular + total eclipses. I don't think any of the suggestions so far are satisfactory. It would be nice to have a short and simple name, preferably of two syllables (or maybe three): "total" and "hybrid" have two syllables and "annular" has three. Jay Pasachoff

From: "Bob Morris"

Probably!

In a "total eclipse" the round moon totally obscures (eclipses) the round sun.

In an annular eclipse, (a) no annular shape is doing any hiding, and (b) no annular shape is hidden!!

In fact, an annular eclipse of the sun is really an "annular reveal of the sun."

The only true "annular eclipse" occurs during a total eclipse of the sun, which also includes an annular eclipse of the corona!

An annulus of moon is hiding the inner corona!

In a partial eclipse, part of the moon is hiding part of the sun so (as Al Franken would say) "That's OK."

However, one can also call a partial eclipse a "crescent reveal of the sun."

Thus to solve the problem forever that total eclipses are special in that ****only**** a total eclipse gives what the layman first and foremost associates with a solar eclipse, "darkness at noon," I hereby suggest that we have only one category of eclipse, and two categories of reveals!

(Continued on page 27)

SETalk

Total eclipse of the sun, annular reveal of the sun, and crescent reveal of the sun.

Only those on the central line of a total eclipse see the sun totally disappear, with a whole set of phenomena not seen during any other type of "so-called" eclipse.

That would forever end the public's confusion about solar eclipses.

Only during a total eclipse can you discard your filter. It is the **only** true solar eclipse.

During a "reveal", since the sun is simply being shown as another "novel" shape, you of course need protective glasses!

This is not April 1, and I am totally serious! Bob Morris

From: "Peter Tiedt"

My 2c ...

What about "complete"

This can apply to all central eclipses, as well as non-central totals and annulars, in that from some point on Earth, the eclipse will appear "complete".

For a partial eclipse, it will never be complete. Just two syllables ...

From: "Glenn Schneider"

As it **is** April 1st, as Bob points out, I suggest we abandon the word "eclipse" entirely.

LUNAR OCCULTATION works for all other stars when they are fully obscured by the moon - so why should we treat the Sun (an "average star" as so many popular authors are fond of saying) differently? A "partial eclipse", then, simply becomes a GRAZING OCCULTATION (of the Sun). Annular eclipses? Why those are just lunar transits, of course.

I think Pat should just turn over all this SEML/SENL stuff to IOTA (<http://www.occultations.org/>) and let Dave Dunham worry about it.

When I dig my tounge out of my cheek, let me ask that whatever terminology others consider it describe events such as the 03 October 1986 eclipse which I had much too laboriously described as a "Diamond Tiara Chromospheric Central Eclipse"

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_86/E1986_MOSAIC.html Bob M., in particular may want to weigh in on that, as phenomenologically it was similar (though a bit more "extreme" to the 20 May 1966 broken annular eclipse he saw and reported on in S&T. -GS-

From: "Fred Espenak"

The discussion on what to call both annular + total eclipses has been interesting. For instance, I was surprised to hear about the term "full-silhouette" eclipse which Jean Meeus attributes to van den Bergh.

However, a term for both annular and total eclipses has already been around for a long time. The Moon (and planets) all cast two shadows: penumbra and umbra. In recent years, the term "antumbra" has come into use to describe and distinguish that portion of the umbra where the Moon's diameter appears smaller than the Sun thus producing an annular eclipse. I have certainly embraced this term in my own publications.

Nevertheless, the original word "umbra" is still general and applies to the entire inner (non-penumbral) shadow regardless of

(Continued on page 28)

SETalk

whether the Moon's apparent diameter appears larger or smaller than the Sun.

A case in point is the classic Meeus, Grosjean and Vanderleen "Canon of Solar Eclipses" (1966). In describing the Besselian elements (page 3), it says:

"... the radius of the umbral cone is I_2 , and is regarded as positive for an annular eclipse, negative for a total eclipse."

Thus, ALL total and annular eclipses (and hybrid eclipses) may be described as UMBRAL eclipses. If the central axis of the Moon's shadow intersects Earth's surface, then the eclipse may also be described as a CENTRAL eclipse.

Note that all CENTRAL eclipses are UMBRAL eclipses, but UMBRAL eclipses may be either CENTRAL (most of the time) or NON-CENTRAL (rarely).

I've not read anything yet in the current thread to make me abandon the above nomenclature. Sincerely, Fred Espenak

From: "Glenn Schneider"

Glenn Schneider wrote: As it *is* April 1st,

was intended to say: "As it *is* soon to be April 1st,... -GS-

From: "Jean Meeus"

< Partial eclipses of zero magnitude are a case to be considered two days from now, not today. Then we can list, for the next partial eclipse of zero magnitude, time of first contact and fourth contacts etc.

You are laughing at me. However, I was very serious. A partial eclipse of zero magnitude is not the same as no eclipse at all! Surely you misunderstood me.

When there is no eclipse at all, for instance at the New Moon of last March 20, then that is NOT an eclipse of magnitude zero.

A partial eclipse of magnitude zero is when, as seen from the observers's place, the Moon is actually in contact with the Sun (externally). In that case, the observer lies on the "limit of simple contact".

If there is no eclipse at all, the Moon passing at a certain distance from the Sun, then the magnitude is not zero, but something like -2 or even -10.

Concerning van den Bergh: no, it is NOT Sydney van den Bergh, but G. van den Bergh (1890-1966), of the Netherlands. He did much work on solar eclipses and in 1955 he published the book "Periodicity and Variations on Solar (and Lunar) Eclipses" (2 volumes). Besides the well-known Saros period, he considered the period of 358 lunations (29 years minus 20 days), which he called the "Inex", and he grouped all 8000 solar eclipses of Oppolzer's Canon in a large Saros-Inex Panorama. Jean Meeus

From: "Bob Morris"

On Wed, 31 Mar 2004, Jean Meeus wrote:

> < Partial eclipses of zero magnitude are a case to be considered two days from now, not today. Then we can list, for the next partial eclipse of zero magnitude, time of first contact and fourth contacts etc.

>

> You are laughing at me. However, I was very serious.

> A partial eclipse of zero magnitude is not the same as no eclipse at all! Surely you misunderstood me.

I understand that "A partial eclipse of zero magnitude is not the same as no eclipse at all!" but I doubt that the public would -- if

(Continued on page 29)

SETalk

news of such an event was published.

I apologize for not saying which hat I was wearing.

> When there is no eclipse at all, for instance at the New Moon of last March 20, then that is NOT an eclipse of magnitude zero.

>

> A partial eclipse of magnitude zero is when, as seen from the observers's place, the Moon is actually in contact with the Sun (externally). In that case, the observer lies on the "limit of simple contact".

>

> If there is no eclipse at all, the Moon passing at a certain distance from the Sun, then the magnitude is not zero, but something like -2 or even -10.

> Concerning van den Bergh: no, it is NOT Sydney van den Bergh, but G. van den Bergh (1890-1966), of the Netherlands.

If you Google ' "van den Bergh" astronomer' the first page of answers has 8 on Sydney and 2 on George!

Sydney, born 1929, is still alive. And in fact I thought Sydney was "G.S. van den Bergh". So you can see where my confusion came from. Sorry.

And Sydney is Holland-born too!

So I thought surely there was only one van den Bergh astronomer from western Europe/Holland!

Is it possible father and son? Probable?

"Sydney Van den Bergh is perhaps Canada's most respected astronomer. Author of over 500 research articles on galactic evolution, star clusters and supernovae, he left a teaching and research position at the University of Toronto to become a research scientist at the NRC's Dominion Astrophysical Observatory in Victoria, where he is currently director. He has served as President of the Canadian Astronomical Society, and has won numerous medals and awards. For 6 years he served as Vice-President of the International Astronomical Union." Bob Morris

From: "Francis Graham"

Dear Jean, I like your use of VdB's definition and it probably will stand for almost all eclipses. But maybe not all. Imagine a total or annular non central eclipse which can be viewed from a place near the poles, but which is always partially below the horizon. When one travels away on the Earth's surface so that it is above the horizon completely, one is out of the zone of annularity or totality.

Is such a thing possible?

If so, it would be an example of a non-central annular or total eclipse that does not present a full silhouette.

I would imagine the circumstances for such an eclipse, if possible, are so rare that even low-single-digit-aged thumbsuckers today will have octogenarian great-grandchildren before it happens. Francis Graham

From: "Wil Carton"

Jean Meeus mailed: <<Concerning van den Bergh: no, it is NOT Sydney van den Bergh, but G. van den Bergh (1890-1966), of the Netherlands. He did much work on solar eclipses and in 1955 he published the book "Periodicity and Variations on Solar (and Lunar) Eclipses" (2 volumes). Besides the well-known Saros period, he considered the period of 358 lunations (29 years minus 20 days), which he called the "Inex", and he grouped all 8000 solar eclipses of Oppolzer's Canon in a large Saros-Inex Panorama.>>

Yes, true. The letter G of the name G.van den Bergh stands for George. His profession was professor of Constitutional Law at the "University of Amsterdam UvA", after World War 2. He was during his youth a politician in the city-council of Amsterdam for the

SETalk

Social-Democratic Party, and in the early years 19-thirties member of the national parlement in The Hague. His studies of the periodicities and variations of eclipses gave him the knowledge to design a method of predicting one eclipse from seven given eclipses in Oppolzers "Canon der Finsternisse", using only primary school arithmetic. The Dutch astronomer David Koelbloed "predicted back to history" with this method most of the solar eclipses in the years 1600 BC till 1206 BC. Van den Bergh published these results in the book "Eclipses in the Second Millennium B.C.", in 1954. The books that Meeus mentioned above, are English translations from original Dutch issues in 1951. It is fun and amazing to compare his maps with modern computer screen images of the program Win-eclipse. Wil Carton.

From: "Jean Meeus"

Francis is probably right. However, consider the following:

(1) Imagine a non-central total (or annular) eclipse at which the Earth's globe penetrates only 69 METERS (!) into the Moon's imbral (or antumbral) cone. Calculation then shows that the border of the shadow is 30 kilometers away in the direction of the Sun, and there the altitude of the Sun's center is 16 arcminutes, so that the entire solar disk is completely visible. Hence, only at those extremely rare cases where the Earth penetrates less than 69 meters in the cone will we have what you describe.

(2) All this is without taking account the effect of the atmospheric refraction. This refraction will complicate the picture!

(3) In the "classical" way of calculating limits etc. of a solar eclipse, the custom is that we neglect the atmospheric refraction, and all calculations are made for sea-level; besides, the Sun is considered to be visible as soon as the geometric altitude of its center is > 0 .

Jean Meeus

"Francis Graham"

I know of no such eclipse having been calculated in the past or future with that characteristic. So, if we do not insist on the Aristotelean-logical standard of a definition of being all-inclusive, but allow a definition to be virtually inclusive, then "full-silhouette" eclipse aptly describes non central and central annular and total eclipses.

Keep in mind that is 69 meters in the perpendicular plane; many miles (about 20) of the Earth's surface near the poles could be involved.

I estimate how often this type of rare eclipse occurs as follows: 20 miles is near the same order of magnitude as the size of the umbral shadow of a total solar eclipse. So it is right between the value of a full silhouette and a deep partial by the same swath width, in order of magnitude, approximately. A calculation was made previously on this list of how long it would take before all of the Earth was covered with swaths of eclipsed areas. If we do this repeatedly for many times after that and before, and average those times, and we call that average time a Great Shadow Cycle, the expectation should be that the non-full-silhouette-eclipse that is annular or total ought to happen once in $2/3$ of the Great Shadow Cycle. Francis Graham



SETalk

Astronomy & Esperanto

Date: Tue, 23 Mar 2004 From: "Gent van R.H." To: HASTRO-LSENL200404LISTSERV.WVU.EDU

Hi, In January 1940, the Utrecht astronomers Marcel Minnaert, Gerard Mulders and Jacob Houtgast published the "Photometric Atlas of the Solar Spectrum from lambda 3612 to lambda 8771", a publication later generally referred to as the "Utrecht Solar Atlas".

Though this atlas was later supplanted by much more detailed atlases of the solar spectrum, it appears to be unique in the sense that it is the only astronomical publication that I know of that used Esperanto as it has a bilingual introduction written in English and in Esperanto.

Perhaps there are more astronomy publications which used Esperanto - who knows any other publications of this kind?

From: "Rolf Sinclair"

One thing that is close to your question was the following: In Bulgaria, in 1993, I noted that the state-operated planetariums in Stara Zagora and Smolyan had a few shows each week narrated in Esperanto. (Most of the time the shows were narrated in Bulgarian.) This apparently was the government's idea (dating back some years to the time of the Communist government) both to promote popular knowledge of astronomy and the use of Esperanto. I don't know if any of this still survives in Bulgaria. (1993 was the year of the Oxford IV conference in Stara Zagora and of the SEAC meeting in Smolyan.) Rolf

From: "Gent van R.H."

Hi Rolf, Thanks for your reply.

Offline, Brenda Corbin has informed me that the USNO library contains at least 6 astronomical publications which use Esperanto (as a second or third language in the introductory material). Most of these publications also originate from Eastern Europe (Bulgaria, East Germany & Yugoslavia).

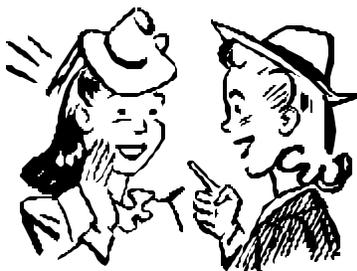
List members with an interest in modern languages may amuse themselves compiling a short list of astronomy terms in Esperanto with the online English-Esperanto dictionaries listed at the bottom of:

<http://esperanto-panorama.net/angla/pakajhoj.htm>

From: "Gale, George"

I spent some time in '86 and '88 as a visiting prof in China. In every big bookstore I went to, esp. the large university/technical bookstore in Beijing, there was a section of books in Esperanto. Although I don't recall any specifically astronomical texts, I certainly recall some physics texts and a cosmology text.

When I asked my colleagues why this Esperanto focus was the case, they told me that there had long been the notion that communism was an international movement, and consequently it should foster other international movements, most particularly movements to break down linguistic borders. Hence, esperanto textbooks. g



SETalk

Dr. Janet Mattei

Date: Mon, 22 Mar 2004 From: "John W. Briggs" To: HASTRO-LSENL200404LISTSERV.WVU.EDU

[The below message is forwarded from Dr. Mario Motta, a member of the American Association of Variable Star Observers.]

Dear members, staff, and friends of the AAVSO. It is my very sad duty to inform you all that Dr. Janet Mattei died at 4:20 PM today 3/22/04 at the Peter Bent Brigham Hospital after a long battle with Acute Myelogenous Leukemia. In typical Janet fashion she fought a heroic battle with this deadly disease for the past 7 months, but in the past few weeks it overcame her. Last Tuesday she asked that I inform her friends worldwide when this time came for her. Last evening she slipped into a coma, and passed away just minutes ago.

The AAVSO has lost a strong leader who has guided our organization to greatness. The world of astronomy has lost a patron of her field. Amateur astronomers the world over have lost a mentor who bridged the world of amateurs and professionals. I, along with many others the world over who knew her well, have lost a dear friend who will be deeply missed.

Information about services will be forthcoming soon.

Mario Motta, MD

John W. Briggs

National Solar Observatory Voice: 505-434-7098

Sunspot, NM 88349 Fax: 505-434-7029

=====

BAA electronic circular No. 00140 <http://www.britastro.org/>

=====

JANET MATTEI

It is with much regret that I pass on the very sad news of the death of the Director of the American Association of Variable Star Observers, Dr Janet Mattei, last Monday after a long battle with Acute Myelogenous Leukemia.

I first met Janet around 1994 when I attended an informal gathering at Cambridge University to discuss amateur-professional collaboration in Variable Star astronomy. Although I had never before met her before, she warmly welcomed me with what I later came to know as the "Janet hug" a very warm and affectionate greeting. I next met her a couple or so years later at a TA meeting where she turned as I entered the room and immediately recognised me and gave me another hug. I was extremely impressed that she should have remembered me as we had not communicated at all in the interim.

I was to meet Janet twice in 2002. The first was at the 2002 AAVSO Hawaii meeting after which we shared a flight from Hawaii to the main-land USA where, despite having run this exhausting Meeting she still found the energy to discuss the analysis of variable star light curves! The second was at the AFOEV Meeting in Bourbon-Lancy, France, where, at the banquet at the end of the meeting we discussed how international co-operation should proceed. Janet will be sorely missed by all by all variable star enthusiasts.

I have also been touched by the many emails from around the world, including Russia and Japan, from both amateur and professional astronomers who perhaps only met her once but who have been moved to express their sadness.

I end with a quote from a close friend of Dr Mattei's, Mario Motta, MD:- "The world of astronomy has lost a patron of her field. Amateur astronomers the world over have lost a mentor who bridged the world of amateurs and professionals." Our condolences go to her husband, Mike, and all her family and friends and especially the staff of the AAVSO headquarters. Roger Pickard Director BAA VSS

SETalk

JANET AKYUZ MATTEI (1943-2004)

Janet Akyüz Mattei passed away on March 22nd after a courageous six-month battle with acute leukemia. She was 61. Janet is survived by her husband, Michael Mattei. The following is excerpted from David Levy's profile of her in Sky & Telescope (December 2003, page 82)....

> http://SkyandTelescope.com/news/article_1224_1.asp

March 23, 2004 | Janet Akyüz Mattei passed away on March 22nd after a courageous six-month battle with acute leukemia. She was 61. Janet is survived by her husband, Michael Mattei. The following is excerpted from David Levy's profile of her in Sky & Telescope (December 2003, page 82).

SETalk

Problem of "nerves" during eclipses

From: JpdowningSENL200404aol.com Date: Wed, 24 Mar 2004 To: SOLARECLIPSESENL200404aol.com

Hi all, I recently read that in the last quarter of the 19th Century when expeditions to eclipses became common, members of the Royal Astronomical Society had a conversation about the "problem of nerves," that is, being so excited that they made mental or procedural errors. One member reported that his hands were shaking so badly he couldn't fine tune his equipment. I've never tried to take any publishable data during an eclipse, so I'm wondering how modern scientists accomplish their work given "the problem of nerves." James Downing jpdowningSENL200404aol.com

From: "Bob Morris"

Modern scientists might use modern techniques, not available in Victorian times: Vallium, Diazepam, Xanax, and other modern miracles. :-) LRM

From: "Jim Low"

JpdowningSENL200404aol.com wrote:

I recently read that in the last quarter of the 19th Century when expeditions to eclipses became common, members of the Royal Astronomical Society had a conversation about the "problem of nerves," that is, being so excited that they made mental or procedural errors.

That reminds me of a story an older cousin told me. He was a professional astronomer working at the old Dominion Observatory in Ottawa. There was an expedition to take measurements at the eclipse of 1954, flying along the path of totality in northern Quebec. All the widows were covered and astronomers were not allowed to "look" at the eclipse, as they were expected to spend all their time with the instruments.

After a number of eclipse trips, I now make a point of putting aside all instruments, including camera and telescope, and just stand in awe as I look at the eclipse with the naked eye during totality.

30 minutes totality and counting. Jim Low, Toronto Centre, Royal Astronomical Society of Canada jimlowSENL200404urania.ca <http://members.rogers.com/jimlow>

From: "cc_marlot"

Dear friends, This "problems of nerves" were among the reasons why automatically exposed photographic plates were taken in high value during that time, especially during the transits of Venus, but also during solar eclipses. Beside this, there was also a new technic who was expected to help the astronomers to solve those problems of nerve : the electricity, which was able to add some precision to the timing of all astronomical events (electric chronographs with paper rolls could keep numerous different timing at the same time, without any risk of going wrong). The (almost) only task remaining to the astronomers, was the survey of all this new apparatus.

Which (I suspect) was also adding a little bit of suspense, if not a new kind of problems of nerve ;-)

At least, this problem were also discussed in France at the same time by french astronomers Faye, Janssen, or others (read the Comptes rendus des Séances de l'Académie des Sciences, or other scientific revue of the time). Christophe Marlot

From: KCStarguySENL200404aol.com

Jim Yes that is a big "problem". So many are too busy taking pictures or photos they actually miss the real splendor. Some spend all their time looking through their telescopes and don't look at the scenery. Others are too awestruck and loose equipment, forget procedures they wanted to do and much more. However I have found you have to formulate and practice what you want to do be-

(Continued on page 35)

SETalk

fore the big event. But even then, the best laid plans don't happen to some. I have been part of this mistake as I only took a few moments of my first 1972 eclipse and took pics the rest of the time. 1979 I saw some of the landscape especially after I saw cars coming down the darkening eclipsed landscape not stopping (this is on my website). 1999 I could not even get pictures during totality but just watched through the clouds. However 1998 I watched through my video camera and saw the sky before taking pictures. During 1999 I could see all of the landscape through my camcorder as I watched with my eyes as the shadow came in (and my camcorder recorded it coming in from over the horizon over 40 miles away) . I had the presence of mind to go 360 around to view the landscape about 2 minutes before totality (on website as panorama) and switched to watch the sun through the camcorder. (I really like looking and watching through the camcorder and saving the video for future reminiscing). Equipment failure made one camcorder fail but I caught much of totality after whirling 360 around (panorama is on my website). I also was able to look and then take the picture of totality after looking through the viewfinder (I had formulated this scene for viewing before the eclipse and it came out and was in Astronomy magazine).

Everyone should take time to just "look up and take in the whole view."

Also Jim I like your "30 minutes and counting." Most people "say" ___ eclipses and counting. That is a nice different touch. Thanks for the insights. Dr. Eric Flescher (kcstarguySENL200404aol.com),

From: "Jim Low"

KCStarguySENL200404aol.com wrote:

Everyone should take time to just "look up and take in the whole view."

At the 1979 eclipse, I took along my wife and two daughters, 7 and 9. We flew with a group to Gimli, Manitoba. My wife wasn't too keen on going to Gimli in February and suggested I not waste the money on her. I insisted she come. She did so, with a "hurrumph." As totality began, I made a point of NOT looking at the eclipse, but instead looked at my wife. The expression was better than any eclipse. Her mouth dropped and she slowly said "Ohhh.... my... god!" She never questioned my eclipse trips after that.

Every eclipse trip has resulted in a major spiritual event in my life. I took my daughters to their next eclipse in 1988, when they were 16 and 18, to the Philippines. They remembered the earlier eclipse well. I had often travelled with my young children, and knew long trips with kids can be a challenge: with bickering, and the "are we almost there?" questions. Teenagers travelling with parents can be even more of a challenge. I was mentally prepared for the "challenging" type of trip. I was wrong. We were with a group. They weren't treated as "cute little kids" by the group, but as adults. They got along with everyone, and helped out. When I returned home, I realised the relationship between my daughters and me had changed. I went on an adventure with my two little girls. Somewhere I lost them. But I returned home with two young women.-- Jim Low, Toronto Centre, Royal Astronomical Society of Canada



T
R
A
N
S
I
T

O
F

V
E
N
U
S

Venus Saros

Date: Mon, 1 Mar 2004 From: "Jean Meeus" To: "INTERNET:SOLARECLIPSESEN200404AULA.COM"

Fraser wrote: I tried my home coordinates in the Venus catalogues and discovered that most of the transits are either invisible from here, or interrupted by sunrise or sunset. I wonder if any particular longitude is favoured for Venus transits? Or has Jean already answered this question in his transits book?

I see no reason why some longitudes would be favoured.

I looked at the 32 Venus transits during the period 1000-3000. The mid-times, rounded to the nearest integer hour UT (in fact Dynamical Time) are distributed as follows:

0 1 2 2 2 3 4 5 5 5 8 8 11 12 13 13 14 14
15 15 16 16 17 18 18 19 19 20 21 21 22 23

So indeed there are few mid-times between 5h and 11h, and many from 13h and 19h.

But that may just be a coincidence and I didn't investigate the subject further. Jean

Venus Transit with Solar Scope



From: "Jean Baptiste Calvarin" To: solareclipsewebpagesSEN200404btopenworld.com Date: Mon, 1 Mar 2004

Dear Astronomer, I am contacting you about the extremely rare celestial event which will take place on the morning of Tuesday June 8, 2004 - namely, the passage of Venus between the Earth and Sun. The last Venus Transit happened in 1882 and the next one visible in its entirety will be in 2117!!!!

For this event the world-wide astronomical community will be mobilized. Everyone will be able to see the Transit - especially the effect of "the black drop" during this passage of Venus - but to do this, it is ESSENTIAL that eyes are protected.

Solarscope has been developed for this purpose, enabling safe Sun observation in bright daylight. Solarscope is the perfect instrument to easily observe the Sun, sun spots and their faculae, eclipses and planet transits like Mercury, or Venus on June 8th 2004. Up to 6 persons can observe the Sun at the same time, as the image is projected onto a large viewing area. This makes Solarscope particularly suitable for group use and school teaching. And it is available from only 49 Euros!

Solarscope also exists in an Education Version with additional material for classroom project work. This facilitates practical workshops for taking measurements that will increase your understanding of the Solar System :

- Earth rotation speed measurement
- Earth orbit ellipticity;
- Earth poles axis inclination
- Sun rotation speed, Solar noon;
- Latitude of the observation spot ;
- Astronomical Unit ;
- Time's Equation (...)

Astronomers, schools and associations will be joining in these experiments and comparing their observations with people in other parts of the world. This will enable the Astronomical Unit to be measured to a high degree of precision: a unique learning experience !

For more information about the Solarscope and our distributors all over the world,



TRANSITS OF VENUS

Thierry Van Durm
Chaussée du Roetulx, 550
7000 Mons
065/755220
<mailto:infoSENL200404astromedia.be>
infoSENL200404astromedia.be
<http://users.belgacombusiness.net/astromedia/sommaire.htm>

-BAERT (Education)
Mr Marc Baert
Essenestraat 16
1740 TERNAT
Tel: [32] 2 583 56 56
baertSENL200404village.uunet.be
<http://www.baert.com>

-Phywe Systeme GmbH (Education)
Monsieur Crochet
Bureau régional Grand Route 79
B-4610 Beyne-Heusay
Tel [32] 43 616241
jl.crochetSENL200404phywe.de ou phywe-
SENL200404skynet.be

-Europlanetarium vzw
Planetariumweg 19 3600 Genk Belgique
Tel: [32] 089/30.79.90 Fax:[32] 089/30.79.91
planetariumSENL200404europlanetarium.com
<http://www.europlanetarium.com>

-Volkssterrenwacht Urania
Matheessensstraat 60 N-2540 Hove Belgique
Tel: [32] 495.55.16.45 [32] 495.55.26.45
kvsSENL200404urania.be
www.urania.be

-TAELM Digital Vision bvba
Kraaikant 16, B-3221 Nieuwrode
Tel. +32 (0)16 56 76 11 Fax +32 (0)16 56 76 19
infoSENL200404taeym.be
www.taeym.be

-Centre Régional d'Initiation à l'Environnement
Parc de Mariemont
7170 Manage Belgique
Jean-Pierre COKELBERGH Tel: 32 64 23 80 10

<<http://www.ulb.ac.be/assoc/crie-mariemont/index.html%20>>

-Euro Space Center
Mr Gering
Rue Devant les Hêtres, 1
6890 Transinne
[32] 0 61 65 64 65
mireille.bodySENL200404eurospacecenter.be
www.ping.be/eurospace

.... Et certainement d'autres revendeurs ...

L'originalité de l'observation est qu'elle sera accessible à tous citoyens, astronomes amateur ou pas. Une seule précaution: posséder une paire de lunettes protectrices (comme pour les éclipses). Vénus sera aisément visible comme une tache noire sur le disque du Soleil. En cas de pénurie de lunettes, prendre un carton, percer un petit trou à l'aide d'un clou, diriger le carton entre une feuille de papier ou un mur (clair) et le Soleil: vous venez de fabriquer une "caméra obscura".

Camera obscura

<http://funsci.com/fun3_en/sky/sky.htm>http://funsci.com/fun3_en/sky/sky.htm

- Voulez savoir si des taches solaires sont actuellement visibles

<http://bass2000.obspm.fr/solar_web.php>http://bass2000.obspm.fr/solar_web.php

Je reste à votre disposition pour d'éventuelles informations. Un prochain message sera consacré aux activités d'observation ouvertes au public et organisée chez moi à Dourbes. Je vous souhaite beaucoup de plaisir à vivre cette observation unique en Europe (la prochaine fois en 2117!). Portez-vous bien d'ici là (après on verra bien)! Amicalement Roland Boninsegna, BONINSEGNA Roland Asteroidal occultations (EAON) Rue de Mariembourg, 35 Observation of variable stars (GEOS) B 5670 DOORBES Astronomy teaching (EAAE) 060/399925

Venus Transit Details

From: eclipseclatSENL200404comcast.net To: "SEML"
<SOLARECLIPSESENL200404aula.com> Date: Sun, 29
Feb 2004

Anyone desiring an MS Word doc copy of this to maintain columnation, please request it offline at eclipseclat-SENL200404comcast.net Raymond Brooks

Let's have some fun and look at Venus with the upcoming June 8 transit.

In a perfect solar system as envisaged by the ancient astro idealists , with non-elliptical gears, perfectly circular crystalline spheres and pure round orbits, Venus would come closest to Earth precisely at the instant the centers of the Sun, Venus and Earth were in an ideal straight line. Thanks to Kepler, however, perfect circles are very hard to find in the sky.

>From an up-moving-down consideration June 8, Venus

T
R
A
N
S
I
T

O
F

V
E
N
U
S

would be closest to Earth when it crosses the plane of the ecliptic. The point of closest approach is sometimes called the osculating point (Latin for: kiss), the proper term is appulse (Latin for: to drive towards) since the orbits never share a common point. But plane crossing happens 14.391 hours before the transit begins, thus shifting the appulse point to occur prior to greatest transit.

The eclipse crossing itself is also not as pristine as the ancient philosophers would have hoped. Since the Moon just then is very low beneath the ecliptic (21,223 miles), Earth swings about 256 miles above it around the barycenter, so Venus is actually that high above the ecliptic when it appears to our eyes to cross the plane of the ecliptic. Venus is then 0.6 arc-seconds above the plane as viewed from the Sun. 2 minutes 42 seconds later Venus truly descends through the plane (as viewed from the Sun) but then appears 2.0 arc-seconds below it to us (the difference of 0.6 vs. 2.0 arc-secs is because Venus is closer to Earth than it is to the Sun)

>From a left-moving-right consideration, appulse would be when Venus passes the Sun's vertical centerline but on June 8 Venus is moving away from the Sun at 428 statute mph biasing the event to after the transit. That effect, however, is more than offset by the Earth also receding from the Sun at 462 mph; net effect of the two planetary recedings is Venus appears to travel 34 mph away from Earth as it passes by June 8, biasing the appulse event in the opposite way to sooner rather than later.

The overall effect of plane crossing, left/right and orbit radial velocity is that closest approach to Earth occurs in the first half of this football game at 06:50 UTC, 97 minutes after the transit begins and 90 minutes before halftime at greatest transit. No half-time entertainment thank you. (You can mark this point on the timeline shown on the web site page <http://sunearth.gsfc.nasa.gov/eclipse/OH/tran/Transit2004-2b.GIF>) Appulse is approximately 93 miles closer to Earth's center than C1 and 86 miles closer than greatest transit with all these motions considered.

Which location on Earth comes closest to Venus? Venus has a declination of 22deg 43.9min at that time so the prime spot on Earth closest to Venus for the transit is at that latitude (due to the radial bulge of the Earth facing Venus) and whatever local meridian places Venus overhead. That local meridian is longitude 77.267 East. The latitude / longitude thus defined on the bulge is smack dab in the middle of the sub-continent India, 652.3 miles due west of Calcutta but more interestingly 650.7 miles SW of Mt Everest (bearing 234). The six mile height of Everest is not enough to make it closer to Venus than the prime spot; Everest's peak at that time is 48 miles farther from Venus. However, what of Everest when Venus passes due south?

The bulge lies 362.6 miles due south of Everest and meridian passage would occur at 06:11:20 UTC at which time separation is 28 miles more than at minimum, adding topographic (latitude) offset of 16.4 miles equals 44.4, minus the 6 mile height of Everest; so the peak is still 38.4 miles farther from Venus than the appulse spot (call it sub-Venus point??)

The entire local area of India near this appulse point is elevated approximately 2000 feet (toward Venus.) Although Everest does not cut it, there are a few mountains (much shorter than Everest but nearer) that do stretch themselves closer to Venus for the transit. Ignominiously the appulse point is 35 miles south of Bhopal where the horrible chemical accident killed so many. A mountain named Pachmarhi, 4430 feet above sea level lies 117 miles ESE which would be 1000 feet closer to Venus if the appulse itself were at sea level but it is not, so it is approx 1000 feet farther. The winner is a mountain called Ubaidullahgan, 17 miles north, 2107 feet high, lying halfway between Bhopal and the appulse point. It appears to be approx 500 feet higher than the general plateau making it about 200 feet closer to Venus. Completely unimportant just an academic.

Below is a very short timeline of Venus events between now and transit. It is curious to compare Venus' orbit to Earth's. For this inferior conjunction, Venus is at perihelion March 21 at the time when Earth is halfway between its perihelion and aphelion, so Venus' radial velocity from the Sun is zero when Earth is 1118 mph, near its maximum radial velocity of 1121 mph three days later on March 24. Venus over the next two months accelerates to 530 mph radially on May 17, near its maximum, when it appears stationary against the background stars in our evening sky. We have slowed by about 300 mph to 821 over those same two months.

The other curious thing is how quickly Earth decelerates radially versus Venus over the next three weeks from May 17 to June 8 transit day. Earth decelerates 360 mph while Venus decelerates only 100 mph. Since the orbit of Earth is more eccentric than Venus (.017 vs. .007) Earth has greater pos / neg acceleration when approaching its perihelion / aphelion. A circular orbit with eccentricity of 0 has no acceleration. On June 8 Earth is only a month away from its far point from the Sun. (Please note, Newton would crucify the likes of me for saying that. Even a perfectly circular orbit experiences radial acceleration which is what keeps it in orbit around the host, here we are talking about radial acceleration as manifested as motion to or from the Sun.)

(Continued on page 40)

TRANSITS OF VENUS

For elliptical orbits,

- 1) radial speed is zero at perihelion while orbital speed is greatest,
- 2) approx halfway to aphelion radial speed is highest,
- 3) roughly 3/4 of the way to aphelion (May 17 to June 17) Earth experiences greatest deceleration in radial speed (approx 480 mph per month) even though the Sun's gravity field is weaker at this distance, 4) and finally at aphelion, radial speed is again zero with the slowest tangential orbital speed.

Venus takes almost two months to attain its radial speed of 530 mph while Earth can change almost that much (480 mph) in a month. How can there be greater acceleration in a weaker gravity field? Because although the side of the gravity well is less steep where Earth orbits, Earth is climbing more UP the slope due to its higher eccentricity, Venus basically cruises along the side of the slope, not too much up and down it, with less radial acceleration.

TIMELINE

The rad column is planet's radial speed in statute mph away from the Sun. V-E is millions of miles distance from Venus to Earth. Closing speed is 3D actual relative velocity of Venus approaching Earth negative mph. (zero at appulse, then becoming positive moving away) Phase is Venus % illuminated Diameter is apparent arc-seconds

Events

Venus high event is greatest ecliptic latitude V stat is Venus stationary

secs	mph	mph	millions	mph	%
mm/dd UTC	Event	V rad	E rad	V-E miles	Closing speed phase
03/21 22:30	Perihel	zero	+1118	71.5	-29,600 55%
21.7					
03/29 01:28	Elong.	+186	+1109	66.4	-30,100 51%
23.4					
04/12 13:00	Ven high	+279	+1099	55.9	-30,000 43%
27.7					
05/17 22:05	V stat	+530	+821	32.8	-21,000 13%
47.2					
06/07 14:53	cross ecl	+437	+469	26.9	-744 0%
57.73					
06/08 05:13	C1	+430	+462	26.9	-62 0%
57.74					
06/08 06:50	appulse	+429	+461.5	26.9	zero 0%
57.74					
06/08 08:20	Grtst	+428	+461	26.9	+57 0% 57.74



Raymond Brooks

From: "Jean Meeus"

Raymond wrote:

< From an up-moving-down consideration June 8, Venus would be closest to Earth when it crosses the plane of the ecliptic. The point of closest approach is sometimes called the osculating point (Latin for: kiss), the proper term is appulse.

Appulse? That's new for me! The term 'appulse' is used for a close APPARENT approach between two celestial bodies ON THE SKY. So an appulse is a just-miss occultation. For instance when, for a given observer, the Moon's limb comes as close as 1 arcsecond from a star, but without occulting it, that's an appulse.

(Continued on page 41)

T
R
A
N
S
I
T
O
F
V
E
N
U
S

But the least distance between two planets, for instance between Earth and Mars, is not called an appulse. It is just the 'closest distance'. There is no special term for it, except that in France the word 'perigee' is often used. Jean Meeus

From: eclipseclatSEN L200404comcast.net

Dear Jean; NASA officially used the term appulse for Apollo X when Astronauts Cernan and Stafford dipped to within 50,000 feet of the surface of the Moon. So I followed suit. Certainly Venus' closest approach to Earth would appear to be an appulse from a remote viewpoint. Ray

From: "Jim Low"

I wonder if the term "appulse" could be used when there is "almost" a partial eclipse of the sun? That would be when there is no official eclipse of the sun on the surface of the earth, but the limb of the moon ALMOST touched the limb of the sun as observed from some place on earth (probably only polar regions) and, in fact, a small partial eclipse could have been observed from an airplane at, say, 10,000 metres.

Okay, I want to know if there have been any such "near-eclipse" calculations made. Are there any in the near future that could be observed from a plane or by astronauts in near-earth orbit? Any interesting "near misses" in the past or future? - Jim Low, Toronto Centre, Royal Astronomical Society of Canada jimlowSEN L200404urania.ca <http://members.rogers.com/jimlow>

From: "Jean Meeus"

< NASA officially used the term appulse for Apollo X when Astronauts Cernan and Stafford dipped to within 50,000 feet of the surface of the Moon.

It was not the first time NASA used wrong terms!

For instance, in 1968 (or about that time) they invented the stupid term "pericynthion" for the point of a trajectory closest to the Moon. From Cynthia, the Moon goddess. However, they apparently did not know the classical terms selenocentric and selenographic, so the correct term should have been periselene.

On the emblem of the astronauts, we could read Apollo 11 but Apollo XII, a mixture of Arabic and Roman digits!

The first "Test and Training Satellite" was called TTS, but the 2nd and the 3rd ones were called TETS and TATS.

Etc, etc...

And, by the way, Apollo X should be Apollo 10. NASA itself said that Arabic digits should be used here. Nobody would write Cosmos CCCLXXXVIII instead of 388! Jean

From: "Jean Meeus"

Jim Low wrote:

< I wonder if the term "appulse" could be used when there is "almost" a partial eclipse of the sun? That would be when there is no official eclipse of the sun on the surface of the earth, but the limb of the moon ALMOST touched the limb of the sun as observed from some place on earth (probably only polar regions) and, in fact, a small partial eclipse could have been observed from an airplane at, say, 10,000 metres.

< Okay, I want to know if there have been any such "near-eclipse" calculations made. Are there any in the near future that could be observed from a plane or by astronauts in near-earth orbit? Any interesting "near misses" in the past or future?

That problem interested me, so I got busy. It was rather easy, because I simply had to modify one of my solar eclipse programs.

(Continued on page 42)

T
R
A
N
S
I
T

O
F

V
E
N
U
S

I investigated the period from year 0 to the year 3000, retaining only the "eclipses" with greatest magnitude between zero and -0.010 (negative, because there is no eclipse). During these 30 centuries the program found 23 cases. They are, however, irregularly distributed in time. For instance, there were three cases in the 18th century, but none between 1787 and 2239.

The last cases was that of 1787 July 14, with a just-miss (magnitude -0.001) in the southern polar regions. The next cases will took place on 2239 April 5, with again a just-miss (magnitude -0.002) again in the southern polar regions.

I cannot divulgue more at this moment. The problem might be the subject for a chapter in my forthcoming third 'Morsels' book, which I hope to prepare this year. Thank to Jim Low, who inspired me for doing the job. Jean Meeus

From: "Jim Low"

Add to my comment about "near miss" eclipses, I would be interested in the elements of all saros eclipses for (first eclipse in cycle)-1 to (last eclipse in cycle)+1, and what the distance from earth would be of the penumbra of each eclipse -- and the maximum distance such a shadow could be. -- Jim Low, Toronto Centre, Royal Astronomical Society of Canada jim-low@SEN200404urania.ca <http://members.rogers.com/jimlow>

From: eclipseclat@SEN200404comcast.net

Jim; I mentioned the near eclipses in Nov 2002. It would be fun to see the Moon's limb occult a big fortuitously placed prominence. Ray Brooks

From: "Jean Meeus"

Raymond Brooks wrote: It would be fun to see the Moon's limb occult a big fortuitously placed prominence.

That would be a problem. Prominences can be quite high, so where would we stop? At "eclipses" with magnitudes -0.20 or even -0.50? That would be a too long (and probably not interesting) list!

Jim Low wrote: Add to my comment about "near miss" eclipses, I would be interested in the elements of all saros eclipses for (first eclipse in cycle)-1 to (last eclipse in cycle)+1, and what the distance from earth would be of the penumbra of each eclipse -- and the maximum distance such a shadow could be.

I did not calculate it. My calculation (yesterday) was not based on the Saros. It investigated all New Moons between the years 0 and 3000, dropped all the cases when the Moon's penumbra passes too far from the Earth, then calculated the Besselian elements or the remaining cases, and dropped all true eclipses and finally retained only the non-eclipses with maximum magnitude between zero and -0.01.

We can have an idea of the maximum possible miss distance for the event preceding the first or following the last true eclipse in a Saros series, as asked by Jim Low, as follows.

In a Saros series, the largest change of Gamma from one eclipse to the next occurs in June-July, when the Earth is near aphelion. Let us consider the two eclipses at the start and at the end of a series in that period of the year:

1953 July 11 max. magnitude = 0.202

1971 July 22 max. magnitude = 0.069

(no eclipse one Saros later)

2011 July 1 max. magnitude = 0.097

2029 July 11 max. magnitude = 0.230

The variation is 0.133 in the both cases, a nice agreement. So we may suppose that 0.133 is the greatest possible change of Gamma from one eclipse to the next in a Saros series. Now, if the first (or last) eclipse of a series is a very small partial eclipse of maximum magnitude 0.001, and if that eclipse occurs in June or July, then the preceding (or next) "eclipse" in that series will be a non-eclipse of maximum magnitude -0.132 approximately. This corresponds to a miss distance of about 460 kilometers.

(Continued on page 43)

Actually, that value of 0.133 mentioned above will vary in the course of the centuries because the eccentricity of the Earth's orbit is varying. So it was larger in the past centuries and will be smaller in the future, because the eccentricity of the Earth's orbit is presently decreasing. Jean Meeus

From: "Robert B Slobins"

I am sure that for such near-misses, earth-orbiting satellites can record them. We could even see partially eclipsed coronas from earth-based coronagraphs.

However, to see the occultation of a large prominence by the moon requires one to be very lucky. Regrettably, the sun does not produce many of them and the large, unstable ones do not rise on cue.

It is difficult enough to catch an eruptive prominence in the act. I have one on film that I recorded in H-alpha just because I bothered to set up the telescope at lunch time in the 40 C+ heat of Laredo, Texas (try +60 C in the sun!). These prominences move very fast, reaching a lunar distance in 45 minutes. Those of you who have seen Leonid meteors have an idea just how fast such a prominence moves.

I would also not appreciate the moon blocking my view of an eruptive prominence. However, I believe that my chances of winning a Lotto jackpot are better than my seeing a prominence eclipsed. cheers/rbs

Venus Transit

From: "Roy Mayhugh" To: "Eclipse Chaser" Date: Fri, 5 Mar 2004

We have completed the acquisition of the telescope equipment for our Venus Transit program to Africa. The construction of the observatory structure is nearing completion. Here is a link to the program details: <http://www.astronomyvacations.com/venus.html>

The observatory is a 30' x 60' concrete block structure with a roll off roof. Inside are 10 permanent piers. The following telescopes are being installed and will be available exclusively for our group of 30 people maximum. (BTW - there are still 5 space available).

Pier # 1 - 6" Astro-Physics Refractor on Astro-Physics 900 ge mount. System is designed for visual and 35mm film use. System includes an 80mm a-p guide scope with SBIG 237a CCD guider. Film camera is Pentax K-1000 astro-cam. System will have a full aperture Baader solar filter for hi-resolution views of the sun.

Pier# 2 - 14" Celestron SC on Celestron ge mount. System is designed for visual and CCD camera use. Camera is an SBIG ST237a w/ cfw-5c color wheel. Camera is self guiding. Adapters for F2 Prime focus(Fastar port), F11 Cass focus and F5 w/ FR237 adapter.

Pier# 3 - 14" Meade LX200 GPS SC on polar Meade Fork mount. System is designed for visual and CCD camera use. Camera is an SBIG ST237a w/ cfw-5c color wheel. Camera is self guiding. Adapters for F10 Cass focus and F3.3 w/ Meade focal reducer.

Pier#4 - 12" Meade LX200 EMC SC on AZ/EL goto mount. System designed for visual use.

Pier# 5 - Solar Station 1 consisting of a Coronado Filers Max Scope 40 hydrogen alpha telescope for looking at chromosphere and prominences. Scope is mounted to a Meade ETX-90 EC telescope with a full aperture baader solar filter for viewing the photosphere. Both scopes are mounted on a Meade polar aligned fork mount.

Pier# 6 - Solar Station 2 consisting of a Sunspotter solar projection telescope, which projects a 4" image of the solar disk in white light.

Pier# 7 - Televue 4" F5.5 apo telescope for very wide field visual viewing. The eyepieces available include a Televue 41mm Panoptic. This combination results in a nearly 5 degree true field of view!

T
R
A
N
S
I
T

O
F

V
E
N
U
S

Pier# 8 - Stellarvue 80mm F5 acro telescope with a full aperture Thousand Oaks Optical type 2 glass solar filter. System can be configured for both prime focus and a-focal camera connection. Camera system is a Phillips TU-Cam pro.

Piers 9 & 10 - are available for our guests to mount their own equipment.

All imaging telescopes are computer controlled. Pograms include The Sky, Maxum DL, CCDops, Adobe Photo-shop, Paint Shop Pro and related astro imaging software. All computers are connected to high speed internet.

Location of the observatory is at 5,000 foot elevation more than 100km from closest village of 3,000 people and has Mag 7+ skies. Latitude is 24 degress south.

Program cost is \$2,900 per person double occupancy and there are five spaces available. Maximum group size is 30 people. Reservations close next Friday (7 days from today). Roy Mayhugh Astronomy Vacations 701 Perdew Ave. Ridgecrest, CA 93555 Phone (888) 412-5317 outside US +1 760 446 0050 CST# 2049910-40

PASSAGE

Date: Sat, 6 Mar 2004 From: "marcoastro" To: VVSSENL200404LISTSERV.CC.KULEUVEN.AC.BE

Naar aanleiding van de venusovergang werd in 1882 voor de eerste maal de dagkrant ' LE PASSAGE DE VENUS ' uitgegeven. De volgende editie verschijnt uiteraard op de ons bekende datum van 8 juni eerstkomend. Degene onder ons die de pen meesterlijk hanteren mogen hun bijdragen nog insturen tot 15 MAART. Dan worden alle inzendingen afgesloten en de lay out voor het krantje opge-maakt. Alle info op: <http://www.lepassage.web.aplus.net/purpose.htm> veel succes, marc.

Close Approach

From: eclipseclatSENL200404comcast.net To: "SEML" Date: 6/3

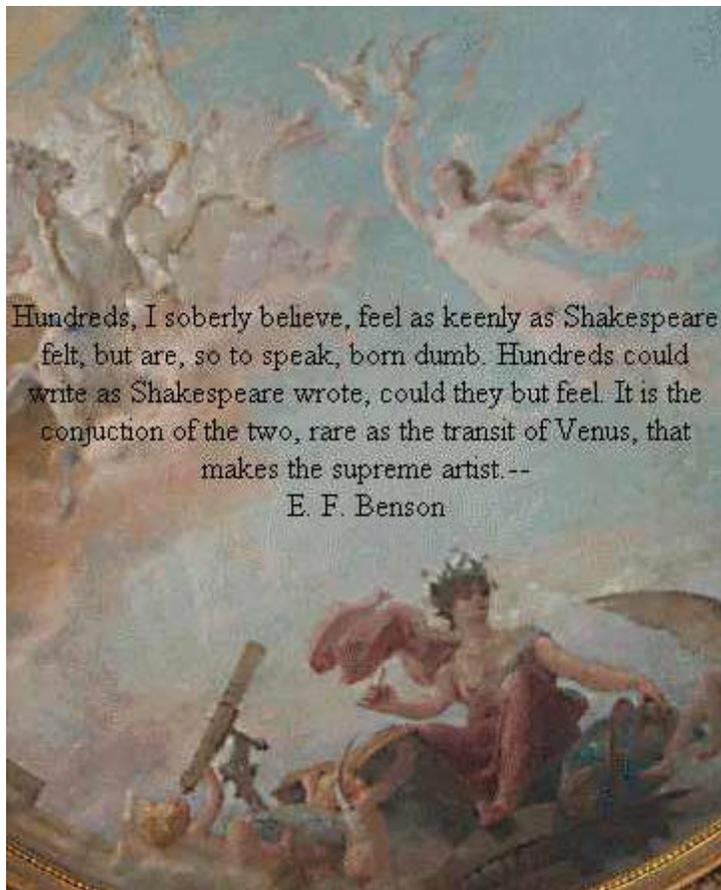
If I might make a request of Jean Meeus, I calculated the closest approach of Venus to Earth as June 8, 2004 06:52:57 UTC. Much of my analysis is based on equations from some of your fine books like, "Astronomical Formulae...." but I am always fearful of some simple error on my part.

Would you mind telling us when closest approach will actually occur? Not important, just curious to celebrate that moment during the very rare transit. Thank you kindly Raymond Brooks

From: "Jean Meeus"

Raymond must be almost correct. Using an accurate ephemeris which I calculated by one of my programs and that is based on Bre-tagnon's VSOP87 theory, I find that the least distance will take place on June 8 at 06:53:03 Dynamical Time. Subtracting the value Delta T = 65 seconds, this corresponds to 06:51:58 Universal Time.

Maybe Raymond actually calculated his instant as Dyn.Time, not as UT. In that case he is only six seconds off. However, my own result can be uncertain by several seconds, as I interpolated between five successive values at intervals of 1 day, and the distances I calculated are rounded to 0.000,000,01 AU. Jean



Hundreds, I soberly believe, feel as keenly as Shakespeare felt, but are, so to speak, born dumb. Hundreds could write as Shakespeare wrote, could they but feel. It is the conjunction of the two, rare as the transit of Venus, that makes the supreme artist.--
E. F. Benson

Venusovergang 8 juni

Date: Sat, 6 Mar 2004 From: "Davy De Mesmaeker" To: VVSSENL200404LISTSERV.CC.KULEUVEN.AC.BE

Weet er ie mand hoe hoog de zon staat bij het begin van de overgang ? Mvg Davy

From: "Jan Vandenbruaene"

Davy, Alles hangt af natuurlijk waar je op Aarde de overgang bekijkt. Voor Vlaanderen is er maar één goede oplossing om dit te weten: De Hemelkalender van de VVS!

Deze meldt: eerste uitwendig contact: 5h20m UT hoogte 14° eerste inwendige contact 5h40m UT hoogte 17°

Uiteraard is dit specifiek voor Ukkel maar dit is zowat voor gans België gelijkaardig.

Handig toch hé zo'n hemelkalender! Je krijgt deze samen met 12 nummers van Heelal als je je lid maakt van de VVS! Indien nog je nog geen lid zou zijn: gewoon doen!! Jan

From: "Hans Coeckelberghs"

sterk... kijk ook eens op <http://www.venusovergang.be> dH

From: "Christian Steyaert"

Er is oa ook de ESO gesponserde site: <http://www.vt-2004.org/> Chris

From: "Lode Stevens"

Hierover heb toch een vraag? Voor mijn coördinaten kom ik uit op het volgende voor

50°47'33"NB

5°30'07"OL

Locatie Galgenberg Tongeren (Ik zal wel aanwezig zijn op het Europlanetarium)

1 ste kontakt

5h30 UT +2 (HK:5h20 h14°) verschil 10min h= 1° 30'

AZ +73°27'

Alt 16° 38'

050648.02n225225.6

2 de kontakt

5h50 UT +2 (HK:5h40 h17°) verschil 10 minuten , h= 30"

AZ +77°34'

ALT 16°38'

050652.27n225230.1

3 de kontakt

11h06UT +2 (HK:11h04 h61°) verschil 2 minuten h= 30'

AZ+165°18'

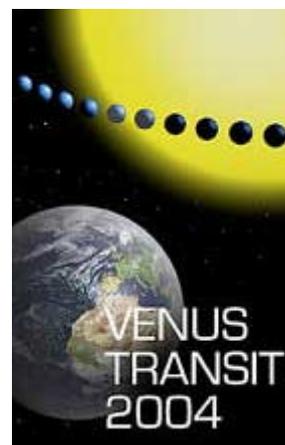
ALT 61° 30'

05074636n225340.6

4 de kontakt

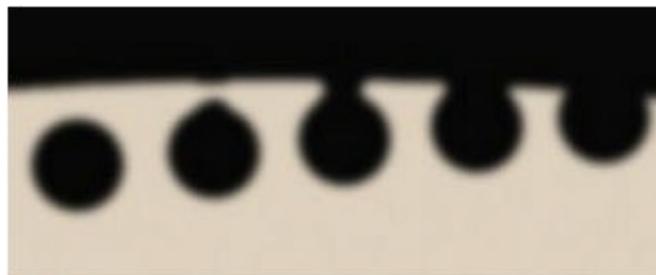
11h22UT +2 (HK:11h23 h62°) verschil 1 minuut h= 1' bijna gelijk

AZ +173°01'



venus overgang eso vt-button

venusovergang l aventure des transits zon%204



(Continued on page 46)

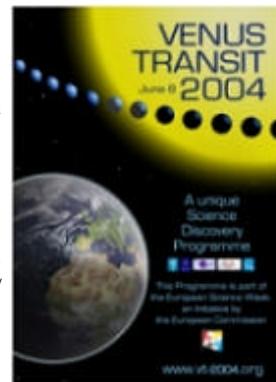
ALT 61 ° 59'
050749.09n225344.0

Ofwel is mijn computer onjuist of we maken de zelfde fout als tijdens de vorige overgang (zie heelal) Lode Stevens

From: "Patrick Poitevin"

Hoi, Zie volgende webpages waar je meer dan 125 steden en plaatsen hebt voor de verschillende contact punten. Er is een andere tabel voor de Amerikaanse steden. <http://sunearth.gsfc.nasa.gov/eclipse/transit/venus/city04-1.html> Doei, Pepe

[venus overgang venustransit%20ESO%20logo](#)



VVS-site: Venusovergang

Date: Sun, 7 Mar 2004 From: "Chris Dorreman" To: VVSEN200404LISTSERV.CC.KULEUVEN.AC.BE

Met nog 3 maanden te gaan kun je voor informatie over de Venusovergang van 8 juni vanaf nu ook terecht op www.vvs.be.
Chris

Venus Transit Effects on Earth

From: eclipseclatSEN200404comcast.net To: "SEML" Date: Fri, 12 Mar 2004

This "boring" transit is already more fun than I anticipated, i.e. boring versus a glorious solar eclipse. Although Venus is less massive than Earth, can Venus affect Earth's orbit more than vice versa? Yes, it can!!

My last discussion on the approach of Venus compared the changes of Earth's orbital radial velocity to Venus'. I noted that Earth can experience greater radial accelerations than Venus, i.e. "...although the side of the (Sun's) gravity well is less steep where Earth orbits, in certain areas Earth climbs more UP or DOWN the slope due to its..." more eccentric orbit. The more circular orbit of Venus keeps its velocity more constant. (rule of thumb I discovered: the maximum radial speed / tangential speed almost exactly equals eccentricity and occurs fairly close to 90 degrees offset from perihelion) This slope of the gravity well prompted me to look at how Venus and Earth affect one another as they pass.

The analogy I envisioned was: Two balls of equal weight are placed on a hill. The hill is not constant slope, the top of the hill is fairly level but the bottom part is a bit steeper. You stretch a coil spring and connect each end to the balls and then release. Although the spring assures that each ball attracts each other equally, the upper ball (Earth) moves rather smartly down the hill but the lower ball (Venus) moves up the hill more slowly. It is the gradient of the hill (the gravity well) which makes the difference in response. It is easier to move a ball down a slight hill than up a steep one. (In the analogy we ignore the fact that both balls would move down the hill because that effect is manifested as centripetal force for planetary motion.)

So I did some basic high school physics, looking at Earth and Venus for a 90 degree sweep through its orbit with one planet attracting the other (taking all the other planets out of the analysis). I came up with Venus (although slightly less massive) draws Earth roughly twice as much as the converse; 1600 vs. 3400 miles. It would seem intuitive since on average the Sun's gravity field is 1.9 times stronger (mean orbital distance Earth / Venus squared) Then using some of the popular planetarium programs (selecting years where the superior planets were basically away from Earth and Venus), I inspected some Venus aphelions as it passed Earth by and Earth aphelions with Venus passing by and compared that to solitary aphelions with neither Earth nor Venus nearby. Earth pulls Venus away from the Sun only approx 1600 miles and Venus, although weaker, pulls Earth in by twice that amount. Curious! The analogy seems correct. So for this transit in June, although Earth and Venus are moving away from each other, they are roughly 4 to 5 thousand miles closer than if they were not paired together. I recall reading of the "Great Venus Effect" or words to that effect in one of Meeus' books but I never thought it would be more than the "Heavier Earth Effect".

I find it truly astounding. A human cannot carry a big rock up Mt. Everest but, Venus from 30 million miles away, can move the entire Earth half its diameter!

T
R
A
N
S
I
T

O
F

V
E
N
U
S

Movie of Todd's 1882 Transit Photos

Date: Wed, 17 Mar 2004 To: SOLARECLIPSESEN200404AULA.COM From: "Fred Espenak"

American astronomer David Todd observed and photographed the 1882 transit of Venus from Lick Observatory. For over a century, his glass plates lay forgotten in the Lick archives until William Sheehan and Anthony Misch unearthed them. The individual photos have been assembled into a wonderful "movie" of the transit. You can download the movie in two resolutions: 640 x 480 pixels (4.0 megabytes) or 320 x 240 pixels (1.2 megabytes). The movies are posted on Sky & Telescope's web site:

http://skyandtelescope.com/observing/objects/sun/article_1187_1.asp

Sheehan also has an article "The Transit of Venus: Tales from the 19th Century" appearing in the May 2004 issue of Sky and Telescope. Finally, Sheehan and John Westfall have written a book "Transits of Venus" which is due out sometime this month (March). You can see info about it at amazon.com:

http://www.amazon.com/exec/obidos/tg/detail/-/1591021758/qid=1079535727/sr=1-1/ref=sr_1_1/104-7278502-8698321?v=glance&s=books Fred Espenak

Transits of Earth as seen from other planets

Date: Mon, 15 Mar 2004 From: "Francis Graham" To: SOLARECLIPSESEN200404AULA.COM

Dear List, Reflecting on the Mars experience, it would be nice to know the transits of Earth as seen from Jovian and Saturnian satellites. One could do zero phase photometry on them at those times, and it might provide something of interest, especially if there is a strong, narrow, "opposition spike" as sometimes happens. Just a thought. Did anyone calculate these? I suspect there would be few, the nodes being what they are. Francis Graham

From: "Jean Meeus"

Francis Graham wrote: Reflecting on the Mars experience, it would be nice to know the transits of Earth as seen from Jovian and Saturnian satellites.

I didn't calculate Earth transits as seen from satellites of the planets, but only as seen from the planets themselves. But they should take place on the same dates (+/- 1 day), I presume, except for the irregular satellites with high orbital inclination.

Transits of Earth as seen from Mars (1900-2200):

1905 May 8

1984 May 11

2084 Nov 10

2163 Nov 15

2189 May 10

Transits of Earth as seen from Jupiter (2000-2050):

2002 Jan 1

2008 Jul 9

2014 Jan 5

2026 Jan 10

Transits of Earth as seen from Saturn (1990-2050):

1990 Jul 14

2005 Jan 13

2020 Jul 20

2049 Jul 16



How these transits are visible from any of the corresponding satellites, and the times, could be found by using a *good*

(Continued on page 48)

T
R
A
N
S
I
T

O
F

V
E
N
U
S

"planetarium" program such as Guide. Jean Meeus

From: "Glenn Schneider"

Apropos of Jean's comments, Transits of Earth usually also entail Transits of the Moon. For example, here is the next Transit of the Earth/Moon system as seen from Mars (10 Nov 2084).

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/OTHER/EARTH-MOON_FROM_MARS_2084.mov -GS-

From: "Fraser Farrell"

I'm wondering if we could go one step better than a simulation, and view these events through our robotic emissaries. The Cassini spacecraft should be orbiting Saturn in Jan 2005; and there might be an active spacecraft at Jupiter (again) in 2014. Of course the spacecraft would have to be within the Earth's antumbra at the right moments...

From Saturn, the transiting Earth would subtend about 2 arcseconds, on a ~200 arcsecond solar disc. Could the Cassini cameras resolve this? cheers,

From: "Glenn Schneider"

There are 12 instruments on the Cassini Orbiter.

The ISS (Imaging Subsystem) contains two cameras for narrow angle and wide angle imaging. Both use 1 Megapixel CCD detectors, and selectable filters for imaging from 0.2 to 1 micron. Its spatial resolution is specced at 6 microradians (~1.2") per pixel. Earth, when closest (and then back side illuminated) will be appx 1.8", so this would be possible, but difficult. However, the instrument doesn't carry any suitable filters, and I don't think that the imaging science team (across the street

from here):

http://ciclops.lpl.arizona.edu/team/iss_team.html

would be too happy to have their camera fried.

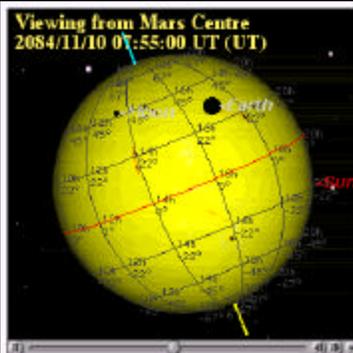
Still, an interesting idea... need to think about other spacecraft... -GS-

From: "Marc Weihrauch"

Hello, Why not ask ESA? Has anyone done so already? Otherwise I could send them an e-mail... Cheers Marc

From: "Nick Quinn"

... and here is an animation of the 1984 May 11 transit created in Redshift 4. <http://www.shadowchaser.demon.co.uk/transit> Clear skies, Nick Quinn.



Transit of Venus - Black Drop/Limb Crossing Observations

Date: Fri, 19 Mar 2004 From: "Glenn Schneider" To: SOLARECLIPSESEN200404AULA.COM

For you transit fans, just out: [http://www.sciencedirect.com/science?_ob=IssueURL&_tokey=%23TOC%236821%232004%23998319997%23487238%23FLA%23display%23Volume_168,_Issue_2,_Pages_223-503_\(April_2004\)%23tagged%23Volume%23first%3D168%23Issue%23first%3D2%23Pages%23first%3D223%23last%3D503%23date%23\(April_2004%23&_auth=y&view=c&_acct=C000005238&_version=1&_urlVersion=0&_userid=109269&md5=731f454c34446c6b18ec2e97b300acc7](http://www.sciencedirect.com/science?_ob=IssueURL&_tokey=%23TOC%236821%232004%23998319997%23487238%23FLA%23display%23Volume_168,_Issue_2,_Pages_223-503_(April_2004)%23tagged%23Volume%23first%3D168%23Issue%23first%3D2%23Pages%23first%3D223%23last%3D503%23date%23(April_2004%23&_auth=y&view=c&_acct=C000005238&_version=1&_urlVersion=0&_userid=109269&md5=731f454c34446c6b18ec2e97b300acc7) (paper #3).

Jay P. and I are co-ordinating with the TRACE project to obtain similar data for the upcoming Venus transit. I have particular interest in contemporaneous NARROW BAND (e.g., H-alpha) ground-based imaging of the limb crossing events (and both before and after to ~ 1/4 Venus radius). If you obtain such images at reasonably high spatial scales, from sites with both "good" and "rotten" seeing (the later which I hope you will not have, but will likely be inevitable) I would be very interested in possibly making use of some of your images in post-observation image analysis. No need to commit, but if you might be interested drop me an email (off SEML unless you have something of general related interest, of course) after 8 June (or before if you like). Cheers, Glenn Schneider <http://nicmosis.as.arizona.edu:8000>

Venus Transit Animations

Date: Thu, 11 Mar 2004 From: "Glenn Schneider" To: SOLARECLIPSESEN200404AULA.COM

For a slightly different perspective (or I should say, literally, point of view) on the upcoming Transit of Venus see:

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/TRANSIT_04/TRANSIT_2004.html

Any takers here for number 8? -GS-

From: "Brian Garrett"

> For a slightly different perspective (or I should say, literally, point of view) on the upcoming Transit of Venus see:

> http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/TRANSIT_04/TRANSIT_2004.html

Those animations are AWESOME. A bit of a jawbreaker for anyone with limited bandwidth, but worth it if you have the time.

> Any takers here for number 8?

Excursions 6, 7 and 8 all sound like a great way to work on your tan, but transportation might be a bit of a problem :-)

From: "Fraser Farrell"

Glenn Schneider wrote http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/TRANSIT_04/TRANSIT_2004.html Any takers here for number 8?

Only if the tour organisers can supply us with Comfy Chairs.....27x earth gravity will certainly aggravate my arthritis! Going to need lots of Soft Cushions too.... ;-))

From: "Jim Low"

This discussion leads to another question: How often are there "Transits of Earth" as viewed from Mars? Animation, please.

When is the next one, and will there be anyone on Mars to observe it? -- Jim Low, Toronto Centre, Royal Astronomical Society of Canada [jimlowSEN200404urania.ca](http://members.rogers.com/jimlow) <http://members.rogers.com/jimlow>

(Continued on page 50)

T
R
A
N
S
I
T

O
F

V
E
N
U
S

T
R
A
N
S
I
T

O
F

V
E
N
U
S

From: mrkSENL200404iac.es

The Arthur C. Clarke short story "Transit of Earth" is based on calculations by Jan Meeus about just one such transit. Mark Kidger

From: "Michael Gill"

Jim, "Transits" by Jean Meeus (ISBN 0943396263) lists all occurrences of planetary transits (including transits of Earth and Venus as seen from Mars):

<http://www.willbell.com/math/MC13.htm> A book I can recommend to everyone on this list. Cheers, Michael Gill

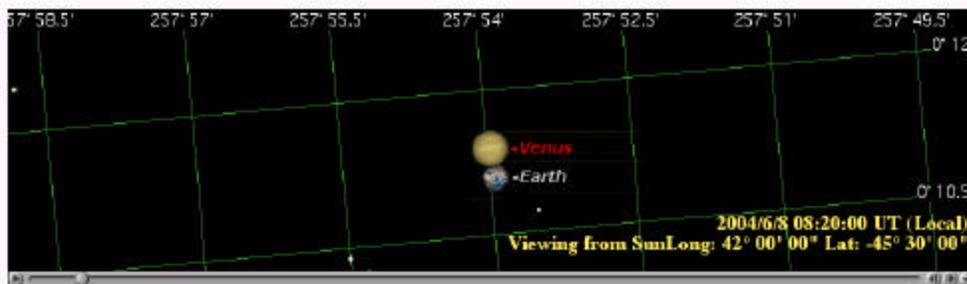
From: "Francis Graham"

On May 10, 1984 there was a transit of Earth as seen from Mars. I understand some previous science fiction writers postulated there would be people on Mars then to see it. Too bad. I was on Earth, at Allegheny Observatory, using the Nelson/Hapke photometer on the 31-inch Keeler reflector. My object was to do some photometry of Mars when there was zero shadows, because, we were in front of the light source. Using this data and comparing it with other data at other times (always a risky proposition) we could get an idea of boulder-strewn areas and surface roughness, I surmised. Alas. Shortly after I began taking readings Mr. Clouds came over. The next transit of Earth would be in 2084, I remember having seen a calculation, and so I decided not to reserve the telescope for that purpose again myself. I understand that Andrew Young did take some photometry that night, but apparently it was not published. Or was it? Francis Graham Kent State

From: "Timo Karhula"

There is a slight negating effect on the brightness of the planet when a transit of the Earth takes place. During the May 11, 1984, transit of the Earth as seen from Mars, I calculated that Mars would become about 1/1400 dimmer (0.0008 magnitudes) during the transit. That is due to the Earth's penumbra cast on Mars during the opposition and thus hiding some of the solar surface.

The difference is so slight so I don't believe it is measurable. Mars's albedo formations has certainly more effect on the planet's brightness anyway. The ordinary "opposition effect" (if Earth would not have been in transit) should be



measurable, though? Cheers, /Timo Karhula

From: "Francis Graham"

Timo is right. Such a difference was out of the question with the Nelson/Hapke photometer, which used a photomultiplier tube. By the way, May 10 was Eastern Daylight Time. It was May 11 UT, as Meeus calculated. I just remembered the date of that evening in local time. This is an interesting discussion. Francis Graham

T
R
A
N
S
I
T

O
F

V
E
N
U
S

Transit from North America

From: "Evan Zucker" To: SOLARECLIPSESEN200404AULA.COM Date: Fri, 5 Mar 2004

I'm not able to travel overseas for this year's transit of Venus, and the transit is not at all visible from my home in California. I thought it might be worth a cross-country flight to catch the last 90 minutes of the transit. The question is where to go. Fred's weather analysis doesn't indicate an obvious best choice.

<http://sunearth.gsfc.nasa.gov/eclipse/transit/TV2004/weather1.html>

<http://sunearth.gsfc.nasa.gov/eclipse/transit/TV2004.html>

Part of the dilemma is that the weather prospects look better to the west, but the further west you go, the less transit will be visible.

Perhaps the best strategy, although not the cheapest, is to wait until the day before and then buy a ticket to the place with the best forecast. I did that for the 10 May 1994 annular eclipse, changing my reservations from El Paso to Springfield, IL at the last minute. (It turned out to be clear in both places.)

Is anybody planning to travel in the U.S. to see the transit? Any recommendations? Evan Zucker

From: "John Leppert"

Although the transit doesn't favor this continent, the 4-year wait for the last one this century in 2012 really does. And, it will especially favor the west coast where nearly all the transit will be visible. Here, near the center of the continent (North Dakota), ingress begins about 5:05P CDT on June 5th (using Guide software), when the sun will have an altitude of about 43o, mid-transit occurs about 8:17, and local sunset at 9:29. Egress occurs about 11:30, some 2 hours after sunset. John Leppert Deneb Observatory

From: "John Leppert"

Sorry about the math. Obviously we have an 8-year wait. John Leppert

"Chasing Venus" exhibition and lecture series at the Smithsonian

Date: Thu, 1 Apr 2004 From: "Ronald Brashear" To: HASTRO-LSEN200404LISTSERV.WVU.EDU

Colleagues: The Smithsonian Institution Libraries is pleased to announce the opening of its current exhibition, "Chasing Venus: Observing the Transits of Venus, 1631-2004", at the Libraries' Exhibition Gallery located in the National Museum of American History, 14th & Constitution Ave. NW, Washington D.C. "Chasing Venus" will tell the story of the transits of Venus using the marvelous illustrations in the rich collection of rare books from the Smithsonian Libraries, supplemented by appropriate artifacts from the National Museum of American History and the United States Naval Observatory.

A series of five (5) noontime public lectures is scheduled to commence on April 8. Details follow.

Ronald Brashear
Curator, "Chasing Venus: Observing the Transits of Venus, 1631-2004"
Head, Special Collections and Dibner Library, Smithsonian Institution Libraries

Chasing Venus Lecture Series
Lectures start at 12:00 noon -- FREE and open to the public Leonard Carmichael Auditorium
National Museum of American History, Behring Center

Presented in conjunction with the Smithsonian Institution Libraries exhibition "Chasing Venus: Observing the Transits of Venus,

(Continued on page 52)

T
R
A
N
S
I
T

O
F

V
E
N
U
S

1631-2004"

March 24, 2004 - April 3, 2005

For more information go to: www.sil.si.edu/exhibitions/chasing-venus

Lecture Series funding provided by NASA Office of Space Science

Thursday, April 8, 2004

"The First Observation of a Transit of Venus: Jeremiah Horrocks and the New Astronomy"

Wilbur Applebaum, Professor Emeritus, Humanities Dept., Illinois Institute of Technology, Chicago, Illinois

Thursday, April 22, 2004

"Endeavour's Wake: Captain Cook and the Transit of Venus"

Richard Fisher, Director, Sun-Earth Connection Division, NASA Office of Space Science, Washington, D.C.

Thursday, May 6, 2004

"Transits of Venus and the American Expeditions of 1874 and 1882"

Steven J. Dick, NASA Chief Historian, National Aeronautics and Space Administration, Washington, D.C.

Thursday, May 20, 2004

"Transits of Mercury and Venus and the Solution of the Black-Drop Mystery"

Jay M. Pasachoff, Director of Hopkins Observatory and Field Memorial Professor of Astronomy, Williams College, Williamstown, Massachusetts

Thursday, June 3, 2004

"Public Reaction to the Transit of Venus, 1882"

David DeVorkin, Curator of History of Astronomy, National Air and Space Museum, Smithsonian Institution, Washington, D.C.



PSE 2004

October eclipse in Nome Alaska

From: "Klipsi" To: SOLARECLIPSES@AULA.COM Date: Thu, 1 Apr 2004

Howdy, folks, I will go for deep partial solar eclipse from Nome Alaska 13 October so I have booked me at Aurora Inn in Nome for October 7-14. (wanna watch Aurora, too)

Anyone joining ? room cost is 130\$ per night. Wanted : Nonsmoking roommate welcome to share cost (65\$ per person), even if your in Nome just for a night or two. contact off-list klipsi@bluewin.ch live report and images will be at <http://eclipse.span.ch/Nome.htm>
Klipsi Paparazzo del Cielo klipsi@bluewin.ch c/o Olivier R. Staiger , Satigny-Geneva Switzerland tel +41.79.449 4630 <http://eclipse.span.ch>

H
Y
B
R
I
D

2
0
0
5

New Tahiti 2005 options

Date: Fri, 05 Mar 2004 To: SOLARECLIPSESEN200404@aula.com From: "Jen Winter - ICSTARS Astronomy"

Since the cat is almost out of the bag, here is what we know about our Tahiti charter (as included in the Ocean Voyages note) :

Our eclipse intercept charter has been approved by Radisson of the Seven Seas... They are not offering the program retail strait to the public. It can only be booked through our agency and our affiliate resellers, groups or associates.

The sailing will be 14 nights on the 6-star MS Paul Gauguin. <http://www.rssc.com/ships/ship.jsp?code=PAU>

We know the cost is not the cheapest in the market, but it should offer the best tool set for eclipse observing ex tahiti.

We selected this ship because we felt it was the only ship to offer enough deck space for all passengers to view the eclipse from. Several other ships did not have adequate room for all passengers to stand on deck to view the eclipse. This ship has about 12,000 square ft of public deck space for 320 passengers. Also, 50% of the cabins from category "C" up have private verandas (which is not included in this figure. That's over 35 square feet per observer. (about 2 meters by 2 meters)

We also chose the ship because of it's speed, the advanced ship stabilization and the fact that it has a film processing lab on-board. The ship also has a watersports & dive platform. I don't know if anyone will be allowed to view from the platform, but some guests may want to be "floating" during totality if just observing visually. Some people may want dive access for tourism reasons too.

Astronomical Tours will host: David H Levy, Olivier 'Klipsi' Staiger, Astronomy Magazine's Michael Bakich.

We embark and return to Papeete, Tahiti because we have to return the ship to service for their next week of sailings when we are done.

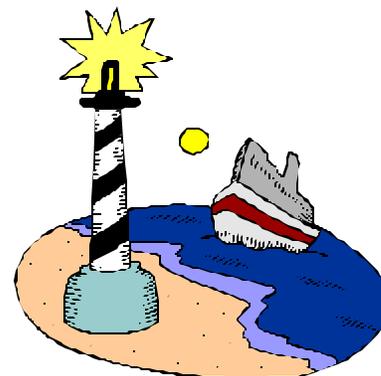
- 02Apr: Papeete
- 03-06 Apr: Cruising Tumatou Archepelago
- 06-07 Apr: Pitcairn
- 08 Apr: Eclipse Intercept
- 11 Apr: Hiva Oa, Marquesas
- 12 Apr: Nuku Hiva, Marquesas
- 14 Apr: Fakarava (a tropical scuba-dive atoll)
- 15 Apr: Moorea
- 16 Apr: Papeete

Cruise Fare:

- Owner Suite \$ 21,184
- Grand Suite \$ 16,144
- Outside A \$ 14,293
- Outside B \$ 11,635
- Outside C \$ 9,595
- Outside D \$ 8,155
- Outside E \$ 7,555
- Outside F \$ 6,595

There are airfare credits which discount airfare to Tahiti also.

There are further details we are still trying to eek-out, so please bear with us in these next few days while we finish the promotion. Clear Skies, jen



3 more options! - Totality 2005

Date: Fri, 05 Mar 2004 To: SOLARECLIPSESEN200404AULA.COM From: "Geoff"

Forwarded is an email from Ocean Voyages, some of you may have received it, but for the benefit of others, they now have 3 additional options for eclipse chasers to consider for the Hybrid Total Solar Eclipse of 2005, in the South Pacific. They are in general more expensive, though.

I think this brings the total number of voyages to... 6? --Geoff Sims

>From: Ocean Voyages <sailSEN200404oceanvoyages.com> Reply-To: "sailSEN200404oceanvoyages.com" <sailSEN200404oceanvoyages.com> To: "gsimsSEN200404iprimus.com.au" <gsimsSEN200404iprimus.com.au> Subject: Eclipse 2005 Date: Thu, 4 Mar 2004 19:18:17 -0800

>Hello All, My name is Bobbi Gallina from Ocean Voyages, International, from Sausalito CA. Ocean Voyages and Off-shore Odysseys have partnered for the Solar Eclipse trip in April 2005. Ocean Voyages has 24 years of expertise in operations in the South Pacific. And because the 2005 Solar Eclipse is in a remote area of the pacific we are offering 3 different packages based on the demand.

>OPTION 1:

>Pick up: Mangareva Drop off: Mangareva

>Dates: April 5-12th Price: \$9,880.00 (Not including air, bar, tip, or communications) Chartered flight from Papeete to Mangareva. We can assist to Papeete from desired location. Mangareva (Gambiers) to eclipse site, wheather permitting, diving in Pitcarin, Henderson Island then back to Mangareva.

>OPTION 2:

>Pick up: Easter Island Drop Off: Tahiti

>Dates: April 2-20 Priced: \$6,580.00-\$15,036.00 (Price Range- A- \$15,036.00

>B- \$13,155.00

>C- \$9,396.00

>D- \$8,930.00

>E- \$7,986.00

>F- \$6,580.00

>OPTION 3:

>Pick up: Galapagos Drop off: Galapagos

>Dates: March 31 -April 14th

>15 days/14 nights

>Price: A: Legend suite \$8,675.00

> B: Moon suite \$7,250.00

> C: Junior suite \$6,675.00

> D: Outside Superior \$4,970.00

> E: 3-share \$4,823.00 per person

> + \$100.00 per person for entry

>OPTION 4: (IF THERE IS SUFFICIENT DEMAND , WE CAN ARRANGE THE FOLLOWING)

>Pick up: PAPEETE Drop off: PAPEETE

>Dates: April 2-April 16th Price: \$6,000.00 - \$10,000.00



(Continued on page 55)

H
Y
B
R
I
D

2
0
0
5

>
>Going to islands of Pitcarin, Hwa Oa, Nku Neva, Takareva.

>
>Thank you very much, and please if there are any questions please don't hesitate to call. Kind Regards, Bobbi Gallina
Ocean Voyages, Inc. 1709 Bridgeway Sausalito, CA 94965 P: 415/332-4681 F: 415/332-7460 E-mail: sailSENL200404o-
ceanvoyages.com www.oceanvoyages.com

From: "Stefan Krause"

Hallo Geoff, this brings the total number of voyages to 4, because option 2 is the cruise with World Discoverer already offered by TQ International, and option 3 is the same Galapagos-Cruise as presented by Astronoicaltours.net/Icstars. I had a quick look at the homepage of Oceanvoyages but didn't find any information concerning the new cruise from/to Mangareva. Greetings! Stefan Krause

From: "Crocker, Tony (FSA)"

Mangareva is the logical choice for a short trip as it is only half a day cruise to the totality line and, unlike Pitcairn, it has an airstrip and a safe harbor. But the price seems way out of line, as much as the 23-day New World Discoverer package.

From: "Jen Winter - ICSTARS Astronomy"

I have spoken with the owner of Ocean Voyages. Obviously, if she is listing our Galapagos charter, then we are working together. She is representing two of our offerings in this broadcast.

The Tahiti Papeete-Papeete is also another of our offerings which has not yet been fully completed, priced and itinerary approved. When details of that sailing are complete, they will be found on our website at: www.AstronomicalTours.net

Right now, until all of that is determined, we only have a place-holder that says: Total Eclipse 2005 Tahiti and French Polynesia

You should find those details finished within the week.

The other charters proposed are ships which the owner offered for our company to charter. One vessel is a very high quality category luxury ship with a capacity of about 100 passengers. The other is a sailing yacht of about 40 passengers, the type used for advanced sailing education. I do not know the amount of usable deck space aboard these vessels from which passengers can view the eclipse.

Astronomical Tours has not chartered either of these vessels, so that promotion would therefore be based on Ocean Voyages chartering or another company doing so. We cannot confirm or deny if these other proposals are confirmed and trips pending. More news as it is available. jen

From: "Daniel Fischer"

Just for the curious ones: the Mangareva cruise is already being advertised at <http://www.offshoreodysseys.com/areas/eclipse.shtml> (I'm missing the name of the ship, though) - at <http://www.astro.uni-bonn.de/~dfischer/2005> I've listed all five cruises now, with links to the actual offer (except in case of the Gauguin where there details haven't appeared on the Astronomical Tours site yet).
Daniel



Crowds at Pitcairn island & nearby

Date: Tue, 09 Mar 2004 To: SOLARECLIPSESEN200404aula.com From: "Jen Winter -

Remember that the cruise ships, MV Discovery and World Discovery II are already visiting the island of Pitcairn.

The MV Discovery with a passenger load of some 715pax is there every year and addresses the issue of landings, activities and operations each time. The fact that an additional number of ships and visitors will visit is not going to be a surprise either. The ships are sailing there now, with the same crew and operations staff who will visit next year at this time. I suspect that the topic of the increase in visitors will come up.

I don't expect any extra skiffs or tenders will be required, because each ship arrives equipped with its own "Tenders" on which it ordinarily debarks its ships standard capacity to ALL of the little island destinations they visit. Otherwise, they wouldn't be scheduled to visit this year. ((Don't worry, the Gauguin has tenders too.))

The increase of the total volume of visitors to Pitcairn will only be approximately 1.6 times. How many times have each of us visited a town, country or beach where visitor influx for an eclipse trip topped 5 to 100 times the total number of standard inbound visitors?

So the port(s) will be a little crowded at times with more boats and visitors coming and going.... Sounds like standard, ordinary umbraphile airport hubub and mayhem to me.

Regarding the idea to change the itinerary of a ship to port at a different island instead... it's not that simple. Itineraries and logistics must be planned, argued and approved years in advance, with politics, logistics, permissions and port relations. It is unrealistic to expect a ship with hundreds of passengers to consider re-aiming to port at a nearby island based on a single or small group's individual goals. The needs of all parties involved must be considered. Currently, access to Oeno is being denied... that is to say, persons are not being granted permission to port, pull up to, or get off onto the island of Pitcairn by the government. These things are delicate and complicated.

Trust the cruise lines and operators to do their jobs. They are pretty good at taking care of these things. Clear Skies, jen

Due to the eclipse, World Discoverer, MV Discovery and now Paul Gauguin are all scheduled to be at Pitcairn on April 7, 2005. Given Pitcairn's small population and the normal requirement for longboat access to reach shore, how will 1,000 cruisers on the same day possibly be accommodated? Can tenders reach shore at Pitcairn? If not most passengers will spend the day staring at Pitcairn from several miles offshore. Perhaps at least one of these ships should be calling at Manga-reva instead or otherwise modifying its schedule.

H
Y
B
R
I
D

2
0
0
5

Pitcairn port call of MV Discovery

From: "Roy Mayhugh" To: solareclipsewebpagesSEN200404btopenworld.com Date: Tue, 9 Mar 2004

The MV Discovery will call on Pitcairn Island 7 April 2005 (Thursday) at 13h00. The ship will depart Pitcairn at 23h00. I am not sure if the excursion to the Island will be done by Pitcairn Long Boats or the ships tenders. I am also not sure of the timings and plans of other ships.

The MV Discovery called on Pitcairn Island a couple of weeks ago. I will be sailing on her later this month to conduct a detailed ship inspection. This will include a meeting with the Cruise Director to obtain detailed reports about all ports of call on the eclipse cruise itinerary, including Pitcairn. The ships photo staff obtained extensive video and still images of Pitcairn. I will assemble a video report, which will be available in a few months.

I will be returning from the ship's inspection the last week of March and will post a report here, with particulars about the Pitcairn port call. Hopefully, specific plans of others will be known then. Cheers to all, Roy



Pitcairn question

From: "Crocker, Tony (FSA)" To: "SOLARECLIPSESEN200404AULA.COM" Date: Fri, 5 Mar 2004

Due to the eclipse, World Discoverer, MV Discovery and now Paul Gauguin are all scheduled to be at Pitcairn on April 7, 2005. Given Pitcairn's small population and the normal requirement for longboat access to reach shore, how will 1,000 cruisers on the same day possibly be accommodated? Can tenders reach shore at Pitcairn? If not most passengers will spend the day staring at Pitcairn from several miles offshore. Perhaps at least one of these ships should be calling at Manga-veva instead or otherwise modifying its schedule.

From: "Michael Gill"

Supposedly, the 960-passenger ship "Crystal Symphony" called there on its 2003 World Cruise:

<http://www.worldcruise wholesaler.com/crystalsymphony2.html>

Did that call actually happen? Or was it a "scenic cruise" with no actual landing? If the passengers were landed, it might give confidence that these numbers of visitors can be dealt with.

(Of course, if the Pitcairn Islanders decide to take up eclipse-chasing themselves, they might all be on Oeno and there'll be nobody at home on Pitcairn!)

It would make sense for some behind-the-scenes discussions to take place between the relevant cruise operators.

Why is the MV Discovery, which is heading eastwards to Peru, calling at Pitcairn on April 7th? To get from Pitcairn on April 7th to the eclipse track on April 8th and then to Easter Island and Peru will require two large changes in heading. I'd say that is two more than necessary. April 9th would be a more sensible day to call and help reduce the impact on the islanders.

April 6 and 7 might be better days for the Tahiti-bound vessels. Cheers, Michael Gill

From: "Odille Esmonde-Morgan & Warwick Lawson"

I've researched a few websites on Pitcairn Island group for those interested in it. It is impossible to land on Pitcairn itself, you have to go in by sea, anchor offshore, and transfer to small boats to land. Often this is impossible due to inclement weather. However, the other (uninhabited) islands of the group seem a bit more promising, but I don't know how one gets permission to land there.

<http://www.cia.gov/cia/publications/factbook/geos/pc.html>

<http://www.winthrop.dk/hender.html>

<http://www.government.pn/>

<http://www.kialoa2.com/SalmonPages/PI1/PI1.htm>

<http://library.puc.edu/pitcairn/index.shtml>

<http://www.lareau.org/album.html>

<http://members.aol.com/ldsebastia/pitcairn/>

<http://members.aol.com/ldsebastia/pitcairn/>

<http://whc.unesco.org/sites/487.htm>



(Continued on page 58)

H
Y
B
R
I
D

2
0
0
5

<http://www.gksoft.com/govt/en/pn.html>

<http://www.worldtravelguide.net/data/bdt/bdt.asp>

http://www.lonelyplanet.com/destinations/pacific/pitcairn_islands/

<http://members.aol.com/ldsebastia/pitcairn/>

Odille Esmonde-Morgan Terranora, NSW, Australia
<http://analog6.members.easyspace.com/analog6SENL200404ozemail.com.au>

From: "Gerard M Foley"

> I've researched a few websites on Pitcairn Island group for those interested in it. It is impossible to land on Pitcairn itself, you have to go in by sea, anchor offshore, and transfer to small boats to land. Often this is impossible due to inclement weather. However, the other (uninhabited) islands of the group seem a bit more promising, but I don't know how one gets permission to land there. <snip>

What can be more promising about any uninhabited island? If there are no docks, the only way to go ashore from a ship is by boat (or swim). Sometimes the ship's boats can be used. Many ships carry inflatable boats which tolerate rocks a little better than rigid ones.

If the weather is too bad to land by boat on Pitcairn, it is unlikely to be any better on any nearby island. As I understand it, none of them offer any significant period of totality. Gerry

Serpent in Paradise by Dea Birkett

Date: Fri, 12 Mar 2004 To: SOLARECLIPSESEN200404aula.com From: "Jen Winter - ICSTARS Astronomy"

An associate recently read the novel, Serpent in Paradise by Dea Birkett. This is an account by a noted British author who found her way to Pitcairn island to learn and write about the elusive and isolated island. What came to pass in the story is rather interesting and reveals that on the surface, the inhabitants show friendliness, but have an underlying dark side of mistrust and treachery.

<http://www.amazon.com/exec/obidos/tg/stores/detail/-/books/0385488718/reviews/002-1769454-4347201#03854887187297>

The most descriptive and informative would be the From Kirkus Reviews. You may need to scroll down.

It's a rather enlightening view of a 130 year sociological science experiment. jen



S&T advertisement

GET ECLIPSED (Advertisement) - Three tours to the April 2005 total-annular (hybrid) solar eclipse

1) 25-Night Cruise-Tour on the World Discoverer, March 28-April 23, 2005 Cruise in luxury aboard the magnificent 150-passenger World Discoverer. Visit Easter Island, Bora Bora, and Tahiti; see uninhabited atolls and authentic villages where age-old customs endure; and witness a total eclipse of the Sun on April 8th. A SKY & TELESCOPE editor will join a distinguished group of expert lecturers who will discuss astronomy, ornithology, botany, and more.

2) 19-Night Cruise-Tour on the MV Discovery, April 3-19, 2005 Experience the South Pacific aboard the newly rebuilt 600-passenger MV Discovery. Join SKY & TELESCOPE editor in chief Rick Fienberg and Dr. E. C. Krupp, director of Griffith Observatory, as we explore Easter Island, Tahiti, Papeete, and Pitcairn Island, and view the total eclipse on the 8th.

3) 5-Night Panama "Ring of Beads" Annular Eclipse, April 4-9, 2005 Join us for an "almost total" annular eclipse in the tropical paradise of Panama. Here the eclipse will be just short of total, and a magical ring of sparkling solar beads will surround the Moon during annularity. Our trip includes a visit to Amador Causeway of the Panama Canal, sightseeing in historic Panama City, a river-canoe ride, and walks through virgin rain forests.

Pick the one that suits your schedule and budget. Reserve your space today! For more information call TravelQuest International at 800-830-1998 or visit: www.tq-international.com.

NASA HSE2005 web page

Date: Mon, 29 Mar 2004 To: SOLARECLIPSESEN200404AULA.COM From: "Fred Espenak"

Although Jay Anderson and I will not be publishing a NASA bulletin for the hybrid and annular solar eclipses of 2005, I am working on web pages for each of these events which contain some of the diagrams, tables and information which would have appeared in a bulletin.

The web page for the hybrid solar eclipse of 2005 April 08 is now online.

You'll find a series of five maps of the path in both high and low resolution GIF's.

There are also eight of tables of detailed predictions and path coordinates as follows:

Table 1 - Elements of the Eclipse

Table 2 - Shadow Contacts and Circumstances

Table 3 - Path of the Umbral (or Antumbral) Shadow

Table 4 - Physical Ephemeris of the Umbral (or Antumbral) Shadow

Table 5 - Local Circumstances on the Central Line

Table 6 - Topocentric Data and Path Corrections Due to Lunar Limb Profile

Table 7 - Mapping Coordinates for the Central Path

Table 8 - Coordinates for the Zones of Grazing Eclipse

The main web page is at:

<http://sunearth.gsfc.nasa.gov/eclipse/SEone/HSE2005/HSE2005.html>

Special thanks to eclipse chaser Michael Gill for beta-testing this page and for catching typographic errors.

Please let me know (off-line) about any bad links, typos, corrections or suggestions. Best regards, - Fred Espenak

**Sea and wave heights from Jay Anderson**

Date: Tue, 30 Mar 2004 To: SOLARECLIPSESEN200404aula.com From: "Jen Winter"

From Jay Anderson:

Galapagos Intercept details: Seas are relatively small - wave heights average 1.5 meters or a little less in the eclipse area.

Temperature: average 26.8 high 30 low 24 Median cloud cover: 3 octas (37%) Cloud cover: clear 7.4% scattered 50% broken 32.7 overcast 11.5% Visibility: 4-10 miles 2.1% more than 10 miles: all the rest Mean relative humidity 85% (hey, it's the equator (but this includes day and night)) prevailing wind: south and southeast Mean wind speed - see above Mean wave height: 0.5 m maximum 3.5 m (this does not include swell height, which has a mean of 1.6 m). They are not strictly additive.

In the French Archipelago the heights are about 1 meter higher. Mean wind speeds in the eclipse area are pretty light-something around 13 km/h and the maximum wind recorded is only 43 km/h.

From: "Glenn Schneider"

For those who would like to independently evaluate the situation with regard to ocean wind, weather, ocean currents, and waves along the path (i.e., also other locations), both historic and current (as time-of-year now is approaching that of TSE2005) let me point you to a few web-based resources:

Ocean Surface Topography and Climate Data Record from Topex/Poseidon: <http://podaac.jpl.nasa.gov/ost/>

Ocean Wind Vectors and Wind Stress: <http://podaac.jpl.nasa.gov/ovw/>

<p>H Y B R I D 2 0 0 5</p>	<p>Current Marine Data & Global Wave Heights http://www.oceanweather.com/data/index.html</p> <p>Sea Surface Temperature:http://podaac.jpl.nasa.gov/sst/</p> <p>The data portal for these records is managed by the Physical Oceanography Distributed Active Archive Center at the Jet Propulsion Laboratory, and you can find more information there at: http://podaac.jpl.nasa.gov/index.html</p> <p>Note: My own independent analysis of the likely prevailing conditions (which I have discussed with some of you off-line from SEML) have been based to a large part on archival data available through the above service.</p> <p>Ocean Surface Topography Visualization (and other) from Topex http://topex-www.jpl.nasa.gov/science/jason1-quick-look/ http://topex-www.jpl.nasa.gov/science/time-series-anim.html</p> <p>Ocean Weather, Inc provides (free of cost) current marine data visualization http://www.oceanweather.com/data/ You may also be interested in some of their related forecasting and analysis products. Cheers, Glenn Schneider http://nicmosis.as.arizona.edu:8000</p>	<p>Ships & stabilizers</p> <p>Date: Tue, 30 Mar 2004 From: "Glenn Schneider" To: SOLARECLIPSESSEN200404AULA.COM</p> <p>Catching up on e-mail, I just "discovered" this thread on "Ships & Stabilizers" started by Jen. I'll add a few comments. I have observed/photographed eclipses from ships four times:</p> <ul style="list-style-type: none"> 1973 from the Canberra off West Africa 1984 from the Cap du Pain off New Caledonia 1998 on the Vandeem in the Caribbean 1999 on the Stellar Solaris on the Black Sea <p>For those where I have carried out fairly extensive photographic programs (notably 1973 and 1984; which I hope SOMEDAY to get the time to digitize results and post) I would echo that it is indeed possible to obtain quite acceptable imagery from shipboard. 1999 proved the exception, as the stability of the ship left much to be desired, but still yielded a few moderately good images.</p> <p>Despite having had moderate to good success photographically I have always maintained that I would MUCH prefer to be on terra firma, an the firmer the better. Though TSE2005 will offer no such option.</p> <p>HOWEVER - my experience in TSE 2003 has forced me to rethink this bit of self-imposed dogma. As reported earlier through SEML for that eclipse I had used a camera platform sporting two orthogonally mounted Kenyon KS-8 dual-gyro assemblies (for three axis stabilization). The CCD camera relied only on the platform stabilization. Also on the platform was a Nikon 35mm camera using a</p>
---------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

400mm VR (vibration reduction) lens. In concert the VR feature WITH the external gyro platform stabilization worked wonderfully, with both high and low frequency modes of vibration/oscillation taken out. This was borne out in extensive pre-eclipse testing, and of course for TSE 2003 itself. I am 100% convinced that this is the way to go for a shipboard eclipse, and unless there is a typhoon, this does provide a pathway which greatly improves shipboard stability.

Even without VR, when properly "tuned" to null out unbalanced torques, the Kenyon gyros work VERY well.

One "technical" note: The NIKON VR lens has a "problem" in that the VR feature automatically shuts down 0.8s after an exposure is taken (it is first engaged by a "soft touch on the shutter button" - to preserve battery life; VR eats batteries). But VR as a predictive integrator also needs to be on for about a second before an exposure is taken. Hence, for an automated sequence (like "umbraphile" provides) VR becomes dormant! As a work-around I had built a simple "keep alive" circuit to defeat this, which plugs into the same NIKON multi-port connector which controls the shutter. If anybody needs/wants information on this I can provide it off line. cheers, -GS-

From: "James Huddle"

There is another point I have not seen addressed in this forum:

I don't know exactly where Gelnn was off the West African coast, but in general the seas in the places he has mentioned are much calmer than in the middle of the Pacific where the hybrid eclipse will be seen. Was it Balboa who named it the "Pacific" Ocean because it was so "calm"? Having sailed the Pacific in passenger liners, I know that the mid-Pacific is not "calm": Balboa either had too few data points, or else he was lying, probably for the same reason they named those two islands in the North Atlantic "Greenland" and "Iceland".

H
Y
B
R
I
D

Modern-day cruise liners are much more stable than the passenger liners I sailed in the 1960's, which were built in the 1930's and 40's. But still, you don't see many cruises in that part of the Pacific. One reason for this is the low density of interesting ports of call. The other reason is that it just is not a comfortable place for a ship to cruise - and, after all, a cruise is supposed to be a vacation. I think the amplitudes of a cruise liner's pitch, roll and yaw on this cruise will be much larger than Glenn has experienced on the Qantas flight or on the four sea cruises he mentioned. It may be more than his dual-gyro, three-axis stabilizer can handle; I don't know the specs on that instrument. It may also be more than a Scopalamine patch (google it) can handle, but seasickness is another problem.

I think most photographers on this trip will want to use short focal length (low magnification) lenses and short exposure times. I have heard some successful reports of shipboard photographers setting their cameras up on tripods, or even holding their cameras in their hands, and waiting until the eclipse slides through the field of view to snap off a shot.

Maybe this is a good eclipse to finally put away the toys and just watch...haven't we, EVERY ONE OF US ON THIS LIST, sworn up and down that ONE day, we're gonna just watch? Jim Huddle

From: "Jen Winter - ICSTARS Astronomy"

2
0
0
5

Words of wisdom from one who heard all the horror stories when everyone's equipment around him fail in Antarctica!

- a note to consider from this lesson: In Antarctica, on the ice, there was no way to get a mount to track. We were at such a low latitude and the sun moving in retrograde, that no mount would actually do the math to track - much less the insane notion of polar alignment! This meant that everyone who attended that eclipse needed to be satisfied with a hand-adjusted tracking method. Thus far, I have not heard from anyone complaining about their photographic failures due to lack of a tracking mount.

Granted, the "A" factor causes plenty of reasons for errors and difficulties and excluding the need to aim or correct is a good idea. However, I would reflect on the eclipse of 99, where a good friend of ours never got his great polaris balanced, and spent the entire time fussing and arguing with the mount's controls and ultimately was unable to perform most of his desired tasks because the mount was out of control.

My point? - On dry land, tracking mounts are an element of frustration and possible error. We can work around their errors when the mount fails due to operator error or circumstances. Sometimes, not tracking, or tracking by hand corrections is easier and more dependable. Perhaps embracing that idea can be more fruitful than adding more components and contingents possible to fail. jen

From: Glenn Schneider"

Having spent a couple of seasons at the South Pole, I was amused, but fully empathetic, with Jen's comments regarding what she calls the "A factor". Her point about the necessity or UNnecessity of tracking for solar eclipse photography should be well considered by all depending upon the needs/goals of specific planned photographic programs. For many photographic programs tracking is indeed unnecessary (though for some it may be either critical or desirable). TSE2005 will primarily present a problem in line-of-sight stability (which is a separate issue) due to the ship-board venues under plan and consideration. Related to my earlier positing, and other comments which arose, I am quite confident from pre-TSE2003 testing that a free-suspended gyro stabilized platform (similar to that which I used on QF 2901) with or without an augmenting VR lens system will do very well ship-board. Just as a note, the way I had done "full up" simulations to test that system was WAY over stressed from what was needed from the B-747, but may be appropriate for the high seas. Since chartering a 747 was impractical ;-)) for such a test, I loaded the whole set-up into the back of a cargo van and used/tested it while photographing through it out the back while driving at 70 miles per hour along I-10, and much slower along some local (bumpy and curved) roads. More tests may be in order for a possible similar system for TSE2005 as the solar altitude will be much higher - but I do think some who are worried about stability issues may want to think about this possibility.

The amusement came from the confluence of Jen's first three of comments, but only if taken out of context of the general discussion. I assure her I am laughing with her at this, as anyone who has had equipment difficulties on the ice (which is nearly everyone, me too) must do - certainly after the fact! But, after, leads to a separate suggestion which may work well for some others (likely for TSE2006, rather than TSE 2005).

(Continued on page 62)

H
Y
B
R
I
D2
0
0
5

>In Antarctica, on the ice, there was no way to get a mount to track.

This, obviously, was under the pressure of the moment for Jen's situation, which is completely understandable! As a general thesis, however, telescopes (including solar telescopes) in Antarctica have and do manage to track! Even back in 1982/3 we had gotten our first deployed telescope to track very accurately - but it had other (significant) problems (live and learn).

>We were at such a low latitude and the sun moving in retrograde,

I think the meaning was high (70S) latitude? But, isn't referring to the solar motion as "retrograde" northern-hemisphere chauvinistic? An Aussie friend (who is not on this list) complains we in the northern hemisphere harp on the backward motions of the sky in the Southern hemisphere. He is quick to point out that if we stood on our heads while observing, it wouldn't seem backward at all.

>that no mount would actually do the math to track

This was the really amusing comment - the general idea of a mount "doing the math". Reminds me I am getting up in years, I suppose. Mounts today, if you buy them off the shelf, I suppose all come with GHz CPUs and lots of "smarts" built into firmware. It would be interesting to learn if there is a "feature" in some of those which won't let an observer enter a latitude "too close" to one (or both) of the poles! Obviously, a "bug" to be reported to the manufacturer. "Dumb" mounts and tracking systems, i.e., a simple geared clock motor with no electronics, may indeed be preferable for solar eclipses. Easy to use, set up. Which brings me to this. I have found it preferable, for some eclipse photographic set-ups to leave the long focus optics (and camera) fixed and horizontal, but feed with an optical flat mirror which is on a simple tracking motor. One can get reversible synchronous motors (with the flick of a switch it will work in northern and southern hemisphere), some already with a built-in gear reduction box to produce once per 24/hr shaft rotation (though needs to be further reduced 2:1 for reflection). Here is an example, nothing new in concept, just an example, of one I have used a couple of times:

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/C_STAT.jpg

Simplicity minimizes "operator" error.

Now, obviously this will not work for a long range of motion (i.e., if you wanted to follow the Sun for hours), but for totality +/- a bit and also set-up time, there there is no problem.

>- much less the insane notion of polar alignment!

The base assembly can tilt up to put the rotation axis at the zenith (if you are at the pole) or lower latitudes (there is a "protractor") on the far side in this photo, so the altitude can be set pretty easily to within about half a degree. (The base is adjusted horizontal with a bubble level, not shown in the above picture).

I pre-compute the solar azimuth(s) as a function of time for a given site and have a "stick on" compass roses which goes on the base (the N/S axis of which aligns with a mark scribed on the base), and have a line which points to the Sun when the base (at a specific time) is properly aligned with north (you can see that in the above photo as the line pointing "back and to the left". Hence, I use the SUN to align to the pole, no need to "see" polaris, or correct 6 degrees from Sigma Octantus - which would indeed be an impossibility for a near-polar solar eclipse!

The above said, however, as Jen suggests, for many cases "no tracking" is best. Cheers, -GS-



T
S
E

2
0
0
6**Two years from today ...**

From: "Matthias Graner" To: "SEML" Date: Mon, 29 Mar 2004

... we will be observing the great eclipse of March 29, 2006. This morning's SAT images don't look very promising for Turkey and even worse for the Black Sea and Georgia. Visibility from the Eastern Mediterranean seems to be better. Libya, however, looks perfect.

Yes, today's weather has almost no significance for the situation in two years time. But, not having seen the Antarctica eclipse and almost certainly missing totality next year, I am really looking forward to the next totality which is visible from somewhat more accessible areas. I think, Libya would be the place to go, if you don't want to take any chances with the weather. If the gradual opening of the country continues, there might even be a tourist industry in Libya in 2006! See you then Cheers, Matthias

From: "Robert B Slobins"

To this group, every total solar eclipse is 'great'. If not, then what are we doing here? :-). Now, I recall a recent article about Libya travel that I read in a very recent Sunday paper. Understand that the infrastructure is quite primitive in the country and getting around may be difficult. Furthermore, even if Khaddafi is mellowing in his old age (read: becoming civilised), he still is the boss. Therefore, controls still exist. Tourists are effectively chaperoned--one needs to be invited to Libya by a tourist agency and so forth. You need to have a very experienced travel agent to handle all of the details. On the other hand, the people are quite friendly, something I can confirm by meeting a Libyan couple in a hotel in Malta in 1993.

There are plenty of things to see in Malta, including some very nice Roman ruins of what used to be very nice Roman cities. It looks like a very interesting place to visit. The question regarding weather is sand. Wind can ruin our day and equipment. cheers/rbs

From: "Peter Tiedt"

>... we will be observing the great eclipse of March 29, 2006.

I may be splitting hairs here, but isn't the word "great" when applied to TSEs reserved for TSEs of > 6 min duration? >This morning's SAT images don't look very promising for Turkey and even worse for the Black Sea and Georgia. Visibility from the Eastern Mediterranean seems to be better. Libya, however, looks perfect.

I have been collecting the 12h00 UT Meteosat 7 images (Visible, IR and Water Vapour) from the Dundee Receiving Station since 10 March, and will continue until about 14 April. These will then be turned into animated .gifs and published on the Africlipse website. I will advise through the SEML when the images are uploaded.

So far, the images definitely point to locations in central west Africa and north Africa as being virtually guaranteed clear skies. I think the easing of travel restrictions to Libya has definitely come at the right time. Africlipse Website pages for 2006.

General Info www.eclipse.za.net/hhtml/2006.html
 Maps www.eclipse.za.net/hhtml/2006_maps.html
 Libya Desert Tour www.eclipse.za.net/hhtml/2006tour.html Peter Tiedt

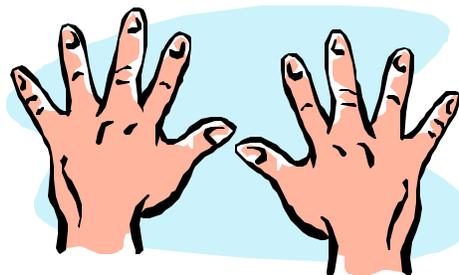
From: "Peter Tiedt"

I have fixed the incorrect links in the previous email

>... we will be observing the great eclipse of March 29, 2006.

I may be splitting hairs here, but isn't the word "great" when applied to TSEs reserved for TSEs of > 6 min duration?

>This morning's SAT images don't look very promising for Turkey and even worse for the Black Sea and Georgia. Visibility from the Eastern Mediterranean seems to be better. Libya, however, looks perfect.



(Continued on page 64)



Joanne & Patrick

*The sole Newsletter dedicated
to Solar Eclipses*



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



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



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

I have been collecting the 12h00 UT Meteosat 7 images (Visible, IR and Water Vapour) from the Dundee Receiving Station since 10 March, and will continue until about 14 April. These will then be turned into animated .gifs and published on the Africlipse website. I will advise through the SEML when the images are uploaded.

So far, the images definitely point to locations in central west Africa and north Africa as being virtually guaranteed clear skies. I think the easing of travel restrictions to Libya has definitely come at the right time. Africlipse Website pages for 2006.

General Info www.eclipse.za.net/html/2006.html
Maps www.eclipse.za.net/html/2006_maps.html
Libya Desert Tour www.eclipse.za.net/html/2006tour.html

From: KidinVSSSEN200404aol.com

I all ready have a tour planned and ready to go for Turkey. I visited last year and was there for a week surrounding the March 29th date. The weather on that day was clear, with less than 20% cloud cover at the site I have chosen to view the eclipse with my group. If clouds do appear, the road patterns are excellent for a quick departure, remaining in the eclipse path for a good 30 miles to find a hole in the sky if that should become necessary. And, Turkey is unquestionably an excellent place to visit, as aprox 50 people that I took there in 1999 will attest to. Rick Brown Eclipse Safaris

SUBSCRIBING TO THE SOLAR ECLIPSE MAILING LIST

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

HOW TO SUBSCRIBE:

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