Volume 9, Issue 3
SOLAR ECLIPSE NEWSLETTER

March 2004

SOLAR ECLIPSE NEWSLETTER

The sole Newsletter dedicated to Solar Eclipses

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Dear All,

Another Solar Eclipse Newsletter. It' brings us closer to the international Solar Eclipse Conference. The program is quite fixed and the registrations are coming in quickly. Many magazines will publish and announce the conference shortly and we hope of course to have a sold out theatre at the Open University of Milton Keynes. Unfortunately, Jean Meeus had to cancel. He suffers lately with some health problems and prefers to attending the conference.

But even more: The Transit of Venus is due soon. The amount of messages, on the SEML and on other mailing lists, show. Many trips are booked and of course we all hope for the best clear skies. This event does not happen that often and we do not want miss it.

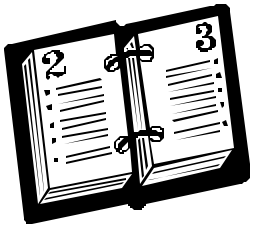
And what about the partial solar eclipse of April. A few SEML subscribers will observe from the southern part of Africa and we wish them all the best.

As you will see, there are a few pictures in the newsletter, which are solar photos, made by some Belgian friends. Enjoy the newsletter and ... please keep those solar eclipse related messages coming ...

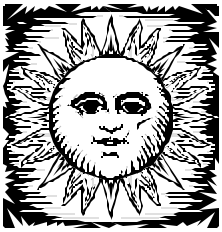
Best regards, Joanne & Patrick

Josch Hambsch dscn1394_crop_ps_red2

SECalendar



March 2004



Dear All,

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

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

http://solareclipsewebpages.users.btopenworld.com

March 01, 1737 "A little before the annulus was complete, a remarkable point or speck of pale light appeared near the middle part of the Moon's circumference that was not yet come upon the disc of the Sun . . . During the appearance of the annulus the direct light of the Sun was still very considerable, but the places that were shaded from his light appeared gloomy. There was a dusk in the atmosphere, especially towards the north and east. In those chambers which had not their lights westwards the obscurity was considerable. Venus appeared plainly, and continued visible long after the annulus was dissolved, and I am told that other stars were seen by some." Refers to the total solar eclipse of 1 March 1737. From: Maclaurin, Philosophical Transactions, vol xi, pp181, 184, 1737. Quoted in UK Solar Eclipses from Year 1 by Williams.

March 01, 1891 Minor Planet (306) Unitas Discovered 1891 March 1 by E. Millosevich at Rome. Named in honor of the Italian astronomer Angelo Pietro Secchi (1818-1878) {see planet (4705)} and also for the unity of Italy. The citation reads: "Al pianeta, scoperto ... dal E. Millosevich, e da lui pregato di denominarlo, do il nome di Unitas, associando in questo nome due idee, la prima il ricordo d'un libro classico del mio illustre predecessore ed amico A. Secchi, la seconda l'unità della patria." (AN 127, 167 (1891)) Named by P. Tacchini (1838-1905), director of the Modena Observatory in 1859. He went to Palermo in 1863 and succeeded Secchi in 1879 as director of the Osservatorio del Collegio Romano. He was a pioneer of solar spectroscopy, paying particular attention to solar prominences which he showed to obey the 11-year period (H 35). Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 02, 1904 There are 3 eclipses in March 1904: 1904 Mar 02 Penumbral Lunar Eclipse, 1904 Mar 17 Annular Solar Eclipse and 1904 Mar 31 Penumbral Lunar Eclipse. The next March with 3 eclipses is 2295: 2295 Mar 02 Penumbral Lunar Eclipse, 2295 Mar 16 Annular Solar Eclipse and 2295 Mar 31 Penumbral Lunar Eclipse. Ref. FE 6/00

March 02, 2002 The Institute for Solar Physics of the Royal Swedish Academy of Sciences announces that its new solar tele-scope on the island of La Palma, Spain, will have first light on Saturday March 2. The telescope design includes a technique that counteracts blurring caused by the atmo s-phere. This will enable the researchers to see and photo-graph details of smaller size than previously possible. The new telescope will address current and important questions concerning solar magnetic fields and the dynam-ics of the upper solar atmosphere and also be used to im-prove our understanding of the formation of stellar spectra. Ref SENL 0402.

March 02, 2910 Not before 2910 March 2 will the island of Tahiti see its first total solar eclipse since that of 1698 April 10. Ref. JM 06/1999.

March 03, 1337 Johannes de Muris remarked that the eclipse occurred about 16 minutes earlier than expected from the Alfonsine tables (ref. PG 3/99).

March 03, 1956 Death of Willem H. Keesom, Dutch physicist. Researched on lower temperature whereas he brought helium in solid condition (1926). He discovered the two kind of helium (Helium I and II). In 1942 he wrote the book Helium. Born in 1876. Ref DD 3/99

March 03, 1959 Launch of Pioneer 4 (US). Passed Moon at 60.000km, first satellite in orbit around the Sun. Ref. DD 03/99.

March 03, 1985 Death of Iosif S. Shklovskii, Russian astronomer. He studied the corona and proved a temperature of millions de-

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grees. Born in 1916. Ref. DD 03/99. Also wrote a landmark book about SETI, later translated to English (with Carl Sagan as co-author) and published in 1966 under the title "Intelligent Life in the Universe". Ref. Fraser Farrell 28.02.02

March 03, 1987 Pioneer 9 (US) stops, was a solar satellite. Ref. DD 3/99.

March 03, 1990 Death of Charlotte E. M. Sitterly, American astronomer. End 20s, she worked together with Charles E. St. John and Harold Babcock at Mount Wilson Observatory on the study of the solar spectrum. She analyzed the lines in the spectrum of sunspots. Published books about solar spectra till she was 90 years old. Born in 1898. Ref. DD 3/99

March 04, -0180 (181 BC) "Year 121 (SE), King An(tiochus), month XII, 29 solar eclipse beginning on the north-west side. In 15 deg day [. . .] over a third of the disk was eclipsed. When it began to become bright, in 15 deg day from north-west to east it became bright. 30 deg total duration. [During this eclipse] east (wind) went. During this eclipse [. . .], Venus, Mercury and Saturn [stood there]. Towards the end of becoming bright, Mars rose (?) The other planets did not stand there. (Began) at 30 deg (= 1) beru after sunrise." Refers to a partial solar eclipse of 14 March 190 BC. Babylon. Babylonian tablet in the British Museum. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, pages 121 and 135.

March 04, -0180 (181 BC) The Empress Dowager died on 18 August 180BC. The eclipse and the Empress' reaction are described in detail in the of Shih-chi, a work composed some 150 years before Han-shu. This is clearly based on an eyewitness report (ref. PG 3/99).

March 04, 1802 Matthew Flinders and his crew aboard "HMS Investigator", while performing the first circumnavigation of Australia, observe a 97percent partial eclipse from (what is now) Port Lincoln. A few weeks later the Flinders expedition met a French expedition commanded by Nicholas Baudin in what is now called Encounter Bay (~36d S 139d E). Although England and France were at war at the time - and both ships were naval vessels - science fortunately prevailed over the affairs of state. Both captains recorded the meeting as a friendly one. And if it had happened there on March 4 then both ships would have seen a total solar eclipse. Meanwhile 200 years later we have a flotilla of sailing ships currently re-enacting these expeditions around the South Australian coastline, which carries place names bestowed by both captains. Ref. Fraser Farrell 28.02.02

March 04, 1866 Sir Joseph Norman Lockyer (1936 - 1920) started his spectroscopic observations of the Sun. He proved quite quick that sunspots were colder places. Ref. DD 3/99

March 04, 1923 Birth of (Sir) Patrick Alfred Caldwell Moore. Parents Gertrude and Charles Caldwell Moore. Author or co-author of almost 200 books, compose 2 operas and host one of the longest running shows on television The Sky at Night (launch 26 April 1957) without a break. His first book was in 1952. He joined the BAA when he was 11 years old and the RAS in 1946. He observed many solar eclipses. (ref. A-S 03/98)

March 04, 1932 Minor planet (1241) Dysona 1932 EB1. Discovered 1932 March 4 by H. E. Wood at Johannesburg. Named in honor of Sir Frank Watson Dyson (1868-1939), Astronomer Royal of England, director of the Greenwich Observatory and president of the International Astronomical Union 1928-1932. (RI 814, H 114) Dyson is also honored by a lunar crater. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 04, 1968 Launch of OGO 5, American geophysics satellite. Studied Solarwind and magnetosphere.

March 05, -1222 (1223 BC) In references the oldest record of a verifiable solar eclipse, on a clay tablet found in the ruins of Ugarit (Syria). This was a total solar eclipse in North Africa and the Middle East. Totality at maximum was 3m55s. Other references say "the sun went down" which also has the expression for "to set".

March 05, 1973 2001 Einstein 1973 EB. Minor Planet discovered and later named in honor of Albert Einstein (1879-1955), American theoretical physicist, mainly known for his relativity. (Ref. Rc 1999)

March 05, 1989 Minor Planet (4105) Tsia 1989 EK. Discovered 1989 March 5 by E. F. Helin at Palomar. Named in honor of the ancient sun symbol used by Indians of the Zia Pueblo in central New Mexico (one of the Seven Golden Cities of Cibola sought by Coronado). Although the symbol's name is normally written "Zia", "Tsia" is the spelling in Keresan, the native language of the Zia

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Pueblo Indians. The symbol now adorns the New Mexico state flag and is often taken as an emblem of the state. It represents first and foremost the sun, the giver of life. From this symbolic sun there radiate four rays consisting of four tongues each; these represent the four cardinal directions (north, south, east and west), the four seasons (spring, summer, fall and winter) and the four stages of life (childhood, youth, adulthood and old age). Also, as ascribed in the official salute to the New Mexico state flag, the Zia is the "symbol of perfect friendship among united cultures". (M 16443) Name proposed by the discoverer, following a suggestion of Louie V. Burke as part of a project during an undergraduate astronomy class at New Mexico State University. Citation prepared by Alan Hale, instructor of the class. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 06, 1787 Birth of Joseph von Fraunhofer in Straubing, Bavaria. The 11th and youngest child of a poor glazier. He contracted tuberculosis in 1825 and died in Munich on 7 June of the following year. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

March 06, 1915 Death of James Francis Tennant (1829-1915). During an eclipse seen from the Red Sea through India to Malaysia and New Guinea, prominences are first studied with spectroscopes and shown to be composed primarily of hydrogen by James Francis Tennant (1829-1915), UK, John Herschel (UK - son of John F.W. Herschel, grandson of William), Pierre Jules Cesar Janssen (1824-1907, France), George Rayet (France), and Norman Pogson (UK/India). (Ref. Rc 1999)

March 06, 1975 Death of Roderick Oliver Redman. On August 31, 1932 G.G. Cillie (UK) and Donald H. Menzel (US) uses eclipse spectra to show that the Sun's corona has a higher temperature (faster atomic motion) than the photosphere. Confirmed, with much higher temperature, by Roderick Oliver Redman (1905-1975) during an eclipse in South Africa on October 1, 1940. (ref Rc 1999)

March 06, 1975 Minor Planet (2273) Yarilo 1975 EV1. Discovered 1975 March 6 by L. I. Chernykh at Nauchnyj. Named for the ancient Slavic god of the Sun, spring, fertility and love. (M 7783) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 07, 1951 Annular eclipse which was seen from New York as a small partial eclipse. Buffalo Bob Smith, died in 1998 at the age of 80 years in North Carolina, broadcasted this eclipse on NBC in 1951 with a camera on top of the RCA building. He had the famous childrens TV show Howdy Doody. (ref. ENB 9/98)

March 07, 1962 Launch of OSO 1, American solar satellite. Studied prominences, corona, XUV and X rays of the sun.

March 07, 1970 Total solar eclipse across Mexico and up the east coast of the United States was observed by millions of people and is widely considered as being largely responsible for beginning today's eclipse tourist industry. This was also the first total eclipse observed by many of today's leading eclipse chasers, including Fred Espenak and Glenn Schneider, as well as some less fanatical eclipse chasers, such as Evan Zucker. Ref. SENL 04.02.

March 07, 1981 Minor Planet (5365) Fievez 1981 EN1. Discovered 1981 March 7 by H. Debehogne and G. DeSanctis at La Silla. Named in memory of Charles Fievez (1844-1890), the pioneer of astrophysics in Belgium. His scientific career at the Observatoire Royal de Bruxelles was short (1877-1890) but very fruitful. In 1880 he started the first spectroscopic laboratory in Belgium. He published two dozen papers on spectroscopy, including an atlas of the solar spectrum, and in 1885 he observed the broadening effect of spectral lines due to the presence of a magnetic field (but without finding the correct interpretation) eleven years before Zeeman. (M 23138) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 08, 1967 Launch of OSO 3 and 4, American solar satellites, see 7 March 1962.

March 09, 1611 Johann Fabricius observed sunspots and conclude de rotation period of the sun.

March 09, 1997 The total solar eclipses of 9 March 1997 and 26 February 1998 were less then 365 days apart. This was the last time two TSE happened in less then a year's time. The next occurance is the two total solar eclipses of 4 December 2002 and 23 November 2003. After that we have the duo TSE year of 1 August 2008 and 22 July 2009, and 22July 2009 and 11 July 2010. Ref. More Mathematical Astronomical Morsels by Jean Meeus; Willmann-Bell, 2002. Patrick Poitevin observed following similar duo's: 1990-1991, 1991-1992, 1994-1995, 1997-1998. He will miss the duo 2002-2003 because of the missing Antarctic eclipse.

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March 10, 0601 On 10th March there was an eclipse of the sun, recorded on a stone tabled. Ref. BAA 6/00. The program WINEclipse indicates that this total eclipse of the sun began in what is now Mauritania, passed across North Africa to Suez and on to Eastern Siberia. Ref. Gerry Foley SENL 03.03.

March 11, 1811 Birth of Urbain Jean Joseph Le Verrier (1811-1877), Verrier (1811-1877), French astronomer. Believer of the existence of planet Vulcan. (ref. Rc 1999)

March 12, 1835 Birth of Simon Newcomb (1835-1909) in Wallace, Nova Scotia, Canada. He used carefully analyzed measurements of stellar and planetary positions to compute motions of the sun, moon, planets, and their satellites. Measured distance to the Sun. Simon Newcomb died 11 July 1909 in Washington DC. Ref. Bibliography of Astronomers by Paul Luther, 1989.

March 12, 1977 Minor Planet (6218) Mizushima 1977 EG7. Discovered 1977 March 12 by H. Kosai and K. Hurukawa at Kiso. Named for a site in the city of Kurashiki {see planet (4578)} near the birthplace of the first discoverer. Mizushima is a scenic spot in the Inland Sea and includes an old battlefield from the conflict between the Genji and Heike samurai families. This battle occurred during an annular eclipse of the sun in 1183, and Heike gained a great victory. (M 26765) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 13, 1977 Minor Planet (4009) Drobyshevskij 1977 EN1. Discovered 1977 March 13 by N. S. Chernykh at Nauchnyj. Named in honor of Ehduard Mikhajlovich Drobyshevskij, physicist and astrophysicist at the Ioffe Physical and Technical Institute in St. Petersburg, author of some original cosmological ideas and theories of the origin of the planets and the minor bodies of the solar system, also known for his research on the magnetic fields of the sun and other stars. (M 19694) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 14, -0189 (190 BC) "Year 121 (SE), King An(tiochus), month XII, 29 solar eclipse beginning on the north-west side. In 15 deg day [. . .] over a third of the disk was eclipsed. When it began to become bright, in 15 deg day from north-west to east it became bright. 30 deg total duration. [During this eclipse] east (wind) went. During this eclipse [. . .], Venus, Mercury and Saturn [stood there]. Towards the end of becoming bright, Mars rose (?) The other planets did not stand there. (Began) at 30 deg (= 1) beru after sunrise." Refers to a partial solar eclipse of 14 March 190 BC. Babylon. Babylonian tablet in the British Museum. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, pages 121 and 135.

March 14, 1879 Birth of Albert Einstein (1879-1955), American theoretical physicist, mainly known for his relativity. (Ref. Rc 1999)

March 15, 1713 Birth of Nicolas Louis de Lacaille, French astronomer. Did measurements of the parallax of the sun and the moon. Observed transit of Venus in 1761.

March 15, 1975 Helios 1, German Solar mission reached the sun at 48 million km. That time a record.

March 16, 1485 "In the year of salvation 1485, in the month of January, according to the ancient custom, the consuls of Augsburg . . . were elected. On the 16th day of March, at the 3rd hour, during meal-time, the Sun was totally eclipsed. This produced such horrid darkness on our horizon for the space of half an hour that stars appeared in the sky. Crazed birds fell from the sky and bleating flocks and fearful herds of oxen unexpectedly began to return from their pastures to their stables." Refers to a total solar eclipse in Augsburg, Germany, of 16 March 1485. From: Achilli Pirmini Gassari, Annales Augustburgenses. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, page 408.

March 16, 1485 (Wednesday) "On the 16th day of March, at the 3rd hour during meal-time, the Sun was totally eclipsed". Achilli Pirmini Gassari : Annales Augustburgenses (ref. PG 3/99).

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

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March 17, 1846 Death of Friedrich Wilhelm Bessel (1784-1846), German astronomer and mathematics. Studied precession, nutation, aberration and inclination of the ecliptic. Known for the Bessel elements needed to calculate solar eclipses.

March 17, 1991 Minor Planet (5377) Komori 1991 FM. Discovered 1991 March 17 by S. Otomo and O. Muramatsu at Kiyosato. Named in honor of Yukimasa Komori, owner of the Astro-Dome Company and a committee member of the Gotoh Planetarium and Astronomical Museum. Born in 1900, he is the oldest known amateur astronomer in Japan, and he had the pleasure of watching Halley's Comet in both 1910 and 1986. His main interests are in observing lunar occultations and solar eclipses. Long active in the popularization of astronomy, particularly over Japanese national radio, he planned and carried out a minute-by-minute broadcast of the total solar eclipse in 1936, linking observers at various stations. (M 21957) Name proposed by the discoverers following suggestions by S. Kimura and E. Kobayashi. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 18, 0489 T'ai-ho reign period, 13th year, 2nd month, day i-hai, the first day of the month. The Sun was 8 fifteenths eclipsed. Wei-shu, chap. 105 (ref. PG 3/99).

March 18, 2360 The next total solar eclipse on Everest will be on march 18th 2360 (totality : 94 sec) and the last one occurred on Jan 18th 1898 (65 sec). Everest will experience a 97% eclipse during the total of 2009. Ref. PA/MS 5/00

March 18, 2003 The Minor Planet Circulars published following on March 18, 2003: (14120) Espenak = 1998 QJ54 Discovered 1998 August 27 by the Lowell Observatory Near-Earth Object Search at the Anderson Mesa Station. Fred Espenak Jr. (b. 1952), of NASA Goddard Space Flight Center, is widely recognized for his calculations of solar eclipses, his magnificent maps of these phenomena and his book 'Totality: Eclipses of the Sun'. Ref. SENL April 2003.

March 20, 0071 "As there was going to be an eclipse on his birthday, through fear of a disturbance, as there had been other prodigies, he put forth a public notice, not only that the obscuration would take place, and about the time and magnitude of it, but also the causes that produce such an event." Refers to solar eclipse of AD 45, on the birthday of the Roman Emperor, Claudius. From: Dion Cassius. "(Lucies) smiled thereat and said . . . 'Now grant me that nothing that happens to the Sun is so like its setting as a solar eclipse. You will if you call to mind this conjunction recently which, beginning just after noonday, made many stars shine out from many parts of the sky and tempered the air in the manner of twilight. If you do not recall it, Theon here will cite us Minnermus and Cydias, Archilochus and Stesichorus besides, and Pindar, who during eclipses bewail "the brightest star bereft" and at "midday night falling" and say that the beam of the Sun [is sped] the path of shade." "Even if the Moon, however, does sometimes cover the Sun entirely, the eclipse does not have the duration or extension; but a kind of light is visible about the rim which keeps the shadow from being profound and absolute." Both these quotations probably refer to a total solar eclipse of 20 March AD 71. Ref FE 01/01

March 20, 0071(?) The Greek philosopher and biographer Plutarch gives a vivid account of a total eclipse in one of his dialogues entitles The Face on the Moon. In this same work, he also makes a brief reference to the corona (ref. PG 3/99).

March 20, 1140 "Afterwards in lent the Sun and the day darkened about the noontide of the day, when men were eating, and they lighted candles to eat by; and that was the 13th of the Calends of April [20 March]. Men were greatly wonder-stricken." The Anglo Saxon Chronicle Refers to the total solar eclipse of 20 March 1140.(Quoted in UK Solar Eclipses from Year 1 by Williams.)

March 20, 1140 "During this year, in Lent, on the 13th of the Calends of April, at the 9th hour of the 4th day of the week, there was an eclipse, throughout England, as I have heard. With us, indeed, and with all our neighbours, the obscuration of the Sun also was so remarkable, that persons sitting at the table, as it then happened almost everywhere, for it was lent, at first feared that Chaos had come again: afterwards, learning the cause, they went out and beheld the stars around the Sun. It was thought and said by many not untruly, that the King [Stephen] would not continue a year in government." William of Malmesbury Historia Novella, Lib. ii sec.35. Refers to the total solar eclipse of 20 March 1140.(Quoted in UK Solar Eclipses from Year 1 by Williams.)

March 20, 1140 (Wednesday) "There was an eclipse of the Sun throughout the whole of England, as I have heard...". Willelmi monachi Malmesburiensis Historia Novella, lib II; Potter (1955, pp 42-43) (ref. PG 3/99).

March 21, 1762 Death of Nicolas Louis de Lacaille, French astronomer. Did measurements of the parallax of the sun and the moon. Observed transit of Venus in 1761.

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March 21, 1928 Death of Edward Walter Maunder F.R.A.S.. Born: 1851 April 12, Middlesex, England and died: 1928, March 21, Greenwich, London, England. Ref. AK 5/00.

March 22, 1868 Birth of Alfred Fowler (1868-1940), British astronomer and physicis t. Studied spectra of the Sun. (Rc 1999)

March 23, 1938 Minor planet (1492) Oppolzer 1938 FL. Discovered 1938 March 23 by Y. Väisälä at Turku. Named in honor of Hofrath Professor Theodor Ritter von Oppolzer (1841-1886), professor of astronomy in Vienna and author of the monumental Canon der Finsternisse. (M 2278) Name suggested by Jean Meeus. Oppolzer is also honored by a lunar crater. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 27, 1951 Birthday of Jan Van Gestel from Belgium. The Solar Eclipse Mailing List (SEML) runs since 10 December 1997 on the server of Jan Van Gestel. Happy Birthday Jan.

March 28, 1998 The Solar Eclipse Section (Patrick Poitevin) organized for the VVS Belgium DDD2 (De Duistere Dag 2 or The Dark Day 2) in the Europlanetarium Genk, Belgium. Speakers were Wasyl Moszowski (Total Solar Eclipses since 1983), Jan Janssens (FNOES and EAGB eclipse observations) and Patrick Poitevin et al (Eclipse of February 26, 1998).

March 30, 1680 There was a total solar eclipse which has even much importance for the chronology of Congo's history, and which was observerd near the rivers Kasai and Sankura (5 degrees south of the equator). It is originally de-scribed in Emil Torday's book "On the trail of the Bushongo" (1925) or later in some of Basil Davidson's books. Ref. SENL 03.03.

March 30, 1882 Minor Planet(224) Oceana Discovered 1882 March 30 by J. Palisa at Vienna. Named for the Pacific Ocean. (H 27) The discoverer communicated from Honolulu on return from the solar eclipse expedition of May 6, 1883 that Governor von Dessarts of Tahiti has named this planet (BAJ Circ., No. 210 (1883)). Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

March 30, 1981 Minor planet (2452) Lyot 1981 FE. Discovered 1981 March 30 by E. Bowell at Anderson Mesa. Named in memory of the French astronomer Bernard Lyot (1897-1952). One of the outstanding experimental astronomers of the twentieth century, Lyot invented the solar coronagraph and the birefringent filter. He developed the study of the polarization of light from planets to a perfection that has hardly been surpassed. (M 6531) Lyot is also honored by craters on Mars and the Moon. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

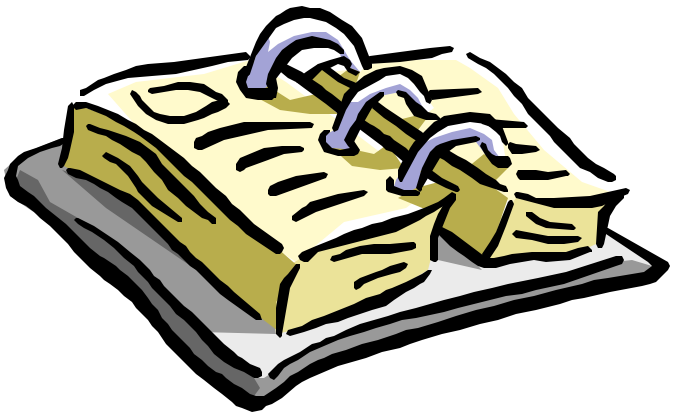
March 31, 1984 Minor Planet (3078) Horrocks 1984 FG. Discovered 1984 March 31 by E. Bowell at Anderson Mesa. Named for Jeremiah Horrocks (1619-1641), the English astronomer who predicted the transit of Venus across the face of the Sun in 1639 Nov. and became the first to see such an event. From his observations he improved the orbital elements and the diameter of Venus. He believed the Moon to have an elliptical orbit with the Earth at one focus - a fact that Newton {see planet (8000)} was later to acknowledge. (M 10846) Name proposed by the discoverer following a suggestion by B. Hetherington. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

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

Best regards,

Patrick and Joanne

solareclipsewebpages@btopenworld.com
http://solareclipsewebpages.users.btopenworld.com



SECalendar

SECalendar for March - typos

From: Tim Collins To: solareclipsewebpagesSENL200403btopenworld.com Date: Fri, 27 Feb 2004 21:53:47

Hi there, Thanks for the information.

A few typo's seem to have crept in -

March 09 "...and conclude de rotation" this should read "and determined the rotation"

March 09 "... The next occurance is the two total solar eclipses of 4 December 2002 and 23 November 2003." has not been updated to reflect past tense as we are now in 2004.

March 10 should "...stone tabled." read "stone tablet" ? Regards Tim Collins

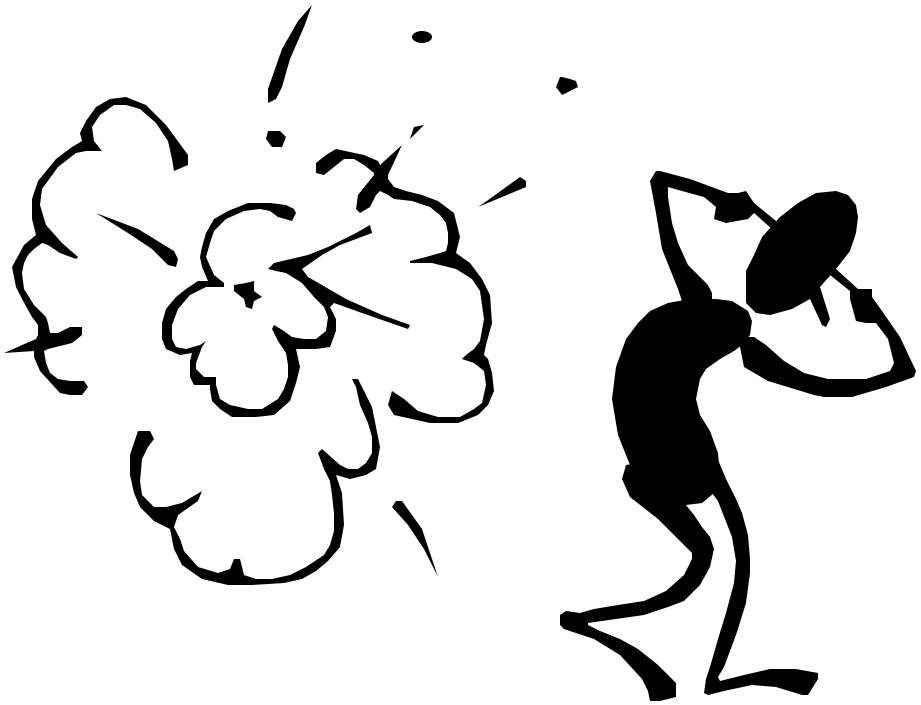
SECalendar for March—Data

From: Onderbeke Julien To: Patrick Poitevin <solareclipsewebpagesSENL200403btopenworld.com> Date: Sat, 28 Feb 2004 13:08:00

Patrick, De tijd gaat vooruit, misschien volgende zin even aanpassen :

March 09, 1997 The total solar eclipses of 9 March 1997 and 26 February 1998 were less then 365 days apart. This was the last time two TSE happened in less then a year's time. The next occurance is the two total solar eclipses of 4 December 2002 and 23 November 2003. After that we have the duo TSE year of 1 August 2008 and 22 July 2009, and 22July 2009 and 11 July 2010. Ref. More Mathematical Astronomical Morsels by Jean Meeus; Willmann-Bell, 2002. Patrick Poitevin observed following similar duo's: 1990-1991, 1991-1992, 1994-1995, 1997-1998. He will miss the duo 2002-2003 because of the missing Antarctic eclipse Vriendelijke groeten Julien

PS : geen spijt dat je niet in Antarctica kon zijn, na de mooie verslagen? En wat voor 2005? Ik gof op 2006 (met de school naar Turkije)



SEDates

SEC2004 WebPages update

Dear All, Only six months to go ...

WebPages for the international Solar Eclipse Conference (SEC2004) are updated. Abstracts and Biographies with pictures of all speakers are on line. The program has been updated and should be in a more or less final format. Of course we will keep you posted on any changes.

Unfortunately, due to health reasons, Jean Meeus had to cancel the conference and we which him of course all the best. Friday night there will be two films. One by Jean Marc Lariviere and the other from the Iran team whom travelled on the icebreaker for the eclipse of last November.

Registrations are coming in fast. Most astronomical magazines received the SEC2004 announcement and will publish soon or add the flyer in the magazine. Be aware that number of seats are limited and that booking is complete when full payment is received. There will be no exceptions when fully booked.

Please see below all major links:

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

SEC2004 Registration http://solareclipsewebpages.users.btopenworld.com/SEC_files/SEC2004Registration.html

SEC2004 Menus for Saturday night http://solareclipsewebpages.users.btopenworld.com/SEC_files/Menus.htm

SEC2004 Register form http://solareclipsewebpages.users.btopenworld.com/SEC_files/RegisterForm.txt

SEC2004 Leaflet http://solareclipsewebpages.users.btopenworld.com/SEC_files/Sec2004.pdf

If you have any questions, or remarks, please feel free dropping us a mail off line. If you have a poster or want to sell anything eclipse related, please let us know. Donations are welcome as well. Best regards,

SEScannings

Dear all, Please find herewith the Index of the February 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 solareclipsewebpagesSENL200403btopenworld.com

And ... keep those solar eclipse related messages coming ... **SENL Index February**

Eclipse sightings

From: KCStarguySENL200403aol.com To: SOLARECLIPSESSENL200403aula.com Date: Wed, 11 Feb 2004 23:39:42

In Sky and Telescope A Tale of Two Eclipses article written by David L. Levy P.82 S&T issue 3/2004 Information and pictures about the eclipse of 11/8/2003 lunar eclipse which was somewhat like the next eclipse appearance

the partial (97%) lunar eclipse of 4/12/1903 written by the author Thomas Hardy Far From the Madding Crowd in the novel it was written "to persons standing alone on a hill during a clear midnight such as this , the roll of the world eastward is almost as palpable movement

Eclipses of exoplanets by Timothy Cantellano Page 77 (also 3/2004 issue)

P.157 11/23 eclipse Frozen Diamond ring by Howard Antos Duncant Raisiting

P. 136 picture of the solar eclipse from air 11/23/2003 High altitude elcipse by Eliot J. Schechter

summarized by Dr. Eric Flescher

SENL for all of 3003 now online

From: Fred Espenak To: SOLARECLIPSES-SENL200403AULA.COM Date: Fri, 27 Feb 2004 16:47:19

It has been an especially busy year and I have been remiss in updating the SENL (Solar Eclipse Newsletter) index page at: http://www.mreclipse.com/SENL/SENLinde.htm

Patrick Poitevin and Francis Podmore recently pointed out that the most recent SENL posted was April 2003. I do apologize and am happy to say that I've brought the index up to date. You can now download any SENL issues from 2003 as well as a special double issue for January 2004. The newest issue (February 2004) is also available. Thanks to both Joanne and Patrick for all the hard work in compiling and preparing the monthly SENL's.

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

SEScannings

I have not had a chance to test the links to the updated index page. If you find any bad links, please let me know privately via email to "Fred.EspenakSENL200403gsfc.nasa.gov". Thanks, - Fred Espenak

From: Fred Espenak

The subject line of my last message should have been "SENL for all of 2003 now online" and not " SENL for all of 3003 now online"

Didn't mean to get a millennium ahead of myself! - Fred Espenak

SETalk

16 - 9 wide screen video problem

From: Klipsi To: SOLARECLIPSES-SENL200403AULA.COM Date: Sat, 07 Feb 2004 11:20:36

dear friends, I got a video problem. I have filmed Antarctica, including the eclipse, in 16-9 widescreen . But when I save it as mpeg or real video file, or even avi, with common free software, these softwares do not take note of the 16-9 widescreen format and thus when playing back in windows media player or real player, the video appears squeezed in 4-3 standard video size instead of widescreen 16-9.

question : is there a software, if possible freeware, which allows to save video in mpeg and actually choose the 16-9 setting, and which player would play it correctly ? thanks for your help. Olivier "Klipsi" Staiger

From: Robert Raye

Klipsi, You might try Divx http://www.divx.com/divx/ I never tried it with 16:9 content, since I don't have original 16:9 source material- but I have seen 16:9 encoded by others with it. The codec is free, so if your player does not already support the Divx format, it is a brainless install. BTW, the Divx logo bug that appears in the bottom right corner of the screen can be turned off (even in the free version). Cheers, Rob Raye http://www.eclipselive.com

From: KCStarguySENL200403aol.com

Klipsi I think that when you render the video you have to make sure it is for a larger screen not just the regular size. Even then I don't know how well it will show. Well Quicktime Pro could do it I believe and it only a few dollars for the plus price ($30). This is for mac or pc versions

SETalk

Cloud cover maps

From: Jay To: solareclipsewebpagesSENL200403btopenworld.com Date: Sat, 07 Feb 2004 19:07:16

Patrick: I have placed monthly global cloud cover maps on my web page at http://home.cc.umanitoba.ca/~jander/. They should be useful for planning any future eclipse, at least until global climate change affects cloud patterns globally :-). Jay

(yes for you pc people- quicktime also works for pcs not only Apple Mac based version- try it sometime you might be surprised how well you like it compared to real player and windoz media player). I will do some more looking around. Hope that helps klipsi. Dr. Eric Flescher (kcstarguySENL200403aol.com),

From: klipsiSENL200403bluewin.ch

thanks a lot to all who sent me suggestions for showing 16-9 video online.

I understood there are two steps. First the encoder, then the player. To make it simple, I got the suggestion to change the player : instead of using windows media player try use one of several available players with which you can set the 16-9 ration on playback. Such as "zoomplayer" or "bsplayer". I downloaded zoomplayer, http://www.inmatrix.com/files/zoomplayer_download.shtml and it works great ! once the interface is open, use rightclick to get in the menu for aspect ratio and set widescreen 16-9. Bingo ! now I can show you some clips of the Antarctica eclipse in 16-9, provided you download and install the zoomplayer (or provided you have another player which allows to set the aspect ratio). here is a short clip http://eclipse.span.ch/2003tse.mpg Klipsi

From: Dale Ireland

Klipsi I don't know any freeware that can do it. Adobe Premiere, Sony Moviemaker, Roxio VideoWave5 are good. It is not so simple. First the software must determine if you recorded it in cropped 720X360 or anamorphic 720X480.

Read these

http://www.guygraphics.com/index2.html

http://www.maxent.org/video/16x9.html

Regardless of how the camera does it you eventually end up with 720X360 (or 720x405 depending on if you calculate by the square pixels of your computer or the elongated pixels of your camcorder) so you are wasting the vertical resolution potential of your camcorder. In the future it would be much better to record at 4:3 them convert later to 16:9 if you want to crop out some of the image. If you crop it out during the recording phase it is lost forever. Dale

SETalk

From: Klipsi

> In the future it would be much better to record at 4:3 them convert later to 16:9 if you want to crop out some of the image. If you crop it out during the recording phase it is lost forever.

I use a Sony PC330 cam , which does not crop out for 16-9, it uses extra available pixels as it is a 3megapixel CCD. Klipsi

Old eclipse legends (?)

From: Dr. B. Pfeiffer Tel.: 06131/3925317 To: HASTRO-LSENL200403LISTSERV.WVU.EDU Date: Sun, 08 Feb 2004

Dear all, some days ago, an amateur astronomer asked about begin and end of a special Saros cycle and if the solar eclipse of October 22, 2137 B.C. was part of it.

With GOOGLE I found that some historians link this eclipse to the story of the two imperial astrologers Hsi and Ho decapitated by the -fourth- emperor of the Xia dynasty.

Two, three years ago, I had read an abtract of a talk of Kevin D. Pang, in which he relates the -first- emperor of the Xia dynasty with a solar eclipse at Sept. 24, 1912 B.C.

Does anyone has information on these topics based on more solid facts than legends? What does archaeology tell us about this dynasty? Regards Bernd Pfeiffer

P.S.: Does anyone knows begin and end of Saros cycle No. 9? Dr. Bernd Pfeiffer Tel. 49-6131-39-25317 /-25883 Inst. f. Kernchemie FAX 49-6131-39-25253 Fritz-Strassmann-Weg 2 D-55128 Mainz Germany e-mail: BERND.PFEIFFERSENL200403UNI-MAINZ.DE WWW: http://www.kernchemie.uni-mainz.de/~pfeiffer/index.html

From: David Pankenier

Further to Joe Kress's reply to Bernd Pfeiffer: Chinese dates in the Bronze Age have been somewhat more securely established following the work of the massive Xia-Shang-Zhou Chronology Project which has undertaken since 1996 to re-examine all the evidence — textual, archaeological, astronomical, etc – bearing on the early chronology. New laboratories were established and equipment acquired to conduct improved C14 testing and calibration of new specimens from a wide array of archaeological sites. The work of hundreds of scholars, both Chinese and foreign, was studied, and all relevant foreign research on the crucial date of the Conquest of Shang by Zhou was translated into Chinese <Wu Wang ke Shang zhi niandai yanjiu> and published in 1997. A preliminary report on the entire project was published in Chinese <Xia-Shang-Zhou duandai gongcheng 1996-2000 nian jieduan chengguo baogao [Beijing: Shijie tushu chuban gongsi, 2000]> which summarizes their results. The final report is now in preparation and will take account of reaction to and debate provoked by the preliminary report. The Project report mentions the so-called Zhong Kang eclipse record on p. 81, but attaches little value to it given the vagueness about the date and dispute about its precise meaning, not least because the record does not contain the terminology otherwise consistently used to refer to eclipses in ancient texts and attested as far back as the Shang oracle bone inscriptions of the 13th-12th c. BCE. Three possible eclipse dates are mentioned as within the ballpark for the founding of Xia: 3 Oct 2043; 6 Dec 2019; 5 Nov 1970 BCE. Extensive discussion in English of the Zhong Kang record and criticism of Pang & Nivison's dating of the eclipse may be found in Early China 15 (1990). My own view, published there as well, is that the language of the purported eclipse record is wholly anachronistic and of no astronomical value. The same applies to Kevin Pang's speculations about the nature of the Chinese calendar at this remote date.

A few corrections to Joe Kress's comments: The historicity of Xia is still much debated among scholars in China and abroad. The Shang oracle bones mention the names of pre-dynastic Shang rulers, but not those of Xia. With the combination of archaeological, textual, astronomical and other evidence amassed by the Xia-Shang-Zhou Chronology Project, pre-841 dates are somewhat more secure, although conclusive archaeological evidence of dynastic Xia remains elusive. Approximate dates for Xia and early Shang are assigned as follows:
Xia ca. 2070 – 1600
Shang (pre-Anyang phase) ca. 1600 – 1300
Yin-Shang (Anyang phase) ca. 1300 – 1046
W. Zhou 1046 – 771
(dates of individual rulers of Shang and W. Zhou are given on pp. 86-88 of the Project preliminary report)

I published the first report of the possible connection between the extraordinarily dense planetary massing of 1953 BCE and the founding of Xia in Early China 9-10 (1983-85), 175-183. For reasons of his own, Kevin Pang has never found it convenient to acknowledge this fact in print.

My own dates for Xia, Shang and Zhou may be found in "The Cosmopolitical Background to Heaven's Mandate, " Early China 20 (1995), 121-176. David Pankenier

Joe Kress wrote: Bernd Pfeiffer and other list readers:
>
> Chinese dates near 2000 BCE are on the border between legend and history. The Xia dynasty is a historical dynasty because their kings are listed on the oracle bones of the subsequent Shang dynasty

SETalk

(without years). But others regard it is semi-legendary because no actual archaeological evidence of it (other than these king lists) has been discovered. The 'Five' (actually seven) Emperors immediately before the Xia are legendary, having been invented during the Zhou dynasty (first millennium BCE) by euhemerizing their gods into men--they do not appear on Shang oracle bones. Furthermore, all Chinese dates before 841 BCE (during the Zhou dynasty) are uncertain, the traditional dates being more and more excessive the farther back in time you go, up to 250 years too early near 2000 BCE if Kevin Pang's dates below are correct.
>
> Here is a list of Chinese dynasties and emperors. The Five Emperors are given traditional dates (adopted first century BCE), whereas the dates of the Xia and Shang dynasties are only slightly revised from traditional dates: http://www.chinapage.com/history/dyna3.pdf (180 KB)
>
> Kevin D. Pang noted http://lalaland.cl.msu.edu/~vanhoose/astro/0001.html that a book written by Liu Xiang during the first century BCE stated: "The ancient Zhuanxu calendar began at dawn, in the beginning of spring, when the sun, new moon and five planets gathered in the constellation Yingshi (Pegasus)." Pang equated this to a near conjunction of the sun, new moon, and five planets that occurred on 5 March 1953 BCE, placing the beginning of the Xia dynasty at 1953 BCE.
>
> The following URL is an online source of The Chinese Classics, translated by James Legge (1879-99), which contains much detailed info (legends?) about the these dynasties. These stories escaped the burning of the books ordered by the first Qin dynasty emperor in 213 BCE, so many of them are based on fact (but which ones?): http://www.sacred-texts.com/cfu/
>
> During the reign of the fourth king of the Xia, the astronomers Hsi and Ho, descendents of those who served the fourth legendary emperor Yao, neglected their duties and failed to observe an eclipse on the first day of the last month of autumn, so the king ordered Prince Yin to execute them: http://www.sacred-texts.com/cfu/sbe03/shu03.htm (at the end)
>
> Kevin Pang's 1912 BCE (-1911) eclipse is mentioned in http://www.archaeometry.org/dating.htm and http://www.bluhorizonlines.org/discover/discover3.html where it is used to determine delta T. It appears that he assigned this eclipse to the first king of the Xia after he determined that the Xia began in 1953 BCE at the above 'grand conjunction'. Joe Kress

Free! Copies of NASA's 2003 eclipse bulletin

From: Fred Espenak To: SOLARECLIPSESSENL200403AULA.COM Date: Mon, 09 Feb 2004 21:30:14

From time to time, I find I must get rid of old NASA eclipse bulletins because I don't have room to store them all. In this case, I still have many copies of the 2003 eclipse bulletin (predictions for both annular and total eclipses of 2003) which must go.

I am offering 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?

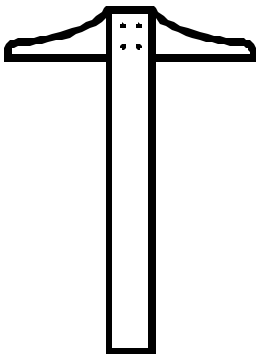
Just email me off line (not on SEML) with your postal address and the number of copies of the 2003 bulletin which you would like to receive. Thanks, - Fred Espenak

From: Frank en Tania

Hello, I apologise for replying on the SEML, but my attempts to reach mr Espenak on [Fred.EspenakSENL200403gsfc.nasa.gov] failed. I would like to order 10 copies of the NASA eclipse bulletin 2003 for the Belgian working group on solar eclipses. Please find my address below. Thank you !

Frank Smits Working group on Solar eclipses Frakke.smitsSENL200403pandora.be Frank Smits Berendansstraat 9 B-2800 Mechelen BELGIUM

Delta T



From: Jean Meeus Date: Wed, 11 Feb 2004 07:18:09

On 2004 January 1, the difference Delta T between the uniform Dynamical Time and the Universal Time was 64.57 seconds.

This is an increase of only 0.10 second during the twelve past months. In the course of the last years, the yearly ibcrease of Delta T has continuously decreased:

2000 Jan 1 Delta T = 63.83 seconds
2001 Jan 1 Delta T = 64.09 seconds (increase = +0.26 sec.)
2002 Jan 1 Delta T = 64.30 seconds (increase = +0.21 sec.)
2003 Jan 1 Delta T = 64.47 seconds (increase = +0.17 sec.)
2004 Jan 1 Delta T = 64.57 seconds (increase = +0.10 sec.)

Jean Meeus

SETalk

BAA Journal web pages

From: Hazel McGee Date: Sat, 14 Feb 2004 21:59:40

Dear all This is just to let you know that I have set up a new feature on the BAA Journal Web page, that Council agreed to some while ago, but which I have not been able to implement until now. We have made an agreement with the online book store Amazon.co.uk, whereby we are paid a small commission for any book or other item that is purchased by a user who has come to their web site by means of a link from our page. I have put these links on the book review pages of the Journal site, and hope that members will find it useful to be able to purchase astronomy books in this straightforward manner, and at the same time earn the BAA a small commission payment.

The purpose of this e-mail is to draw your attention to this feature, and to suggest that should you personally be intending to buy any books, CDs, software or electronic equipment from Amazon, it is advantageous to the BAA if you do so by means of following a link from the BAA Journal web pages. Best regards Hazel McGee Visit the BAA Journal World Wide Web page: http://www.britastro.org/journal/

Eclipse music

From: KCStarguySENL200403aol.com To: SOLARECLIPSESSENL200403aula.com Date: Sat, 14 Feb 2004 22:46:26

Recently someone, I think it was Klipsi, asked about some eclipse music.

Here is what my son, a junior in HS at the Interlocken Academy in Michigan told me about it.

" The eclipse music that you sent me is a score for viola, guitar and piano, the only way I could listen to it is if I dictated it into the computer (which would take awhile). " Hope that helps.

Max number of Consecutive non-central annular eclipses

From: John Tilley To: SolarEclipsesSENL200403aula.com Date: Sat, 14 Feb 2004 19:44:18

Something for those into eclipse theory trivia - which really surprised me.

What is the maximum number of consecutive non-central eclipses that can occur in a saros? For total eclipses I think its one. But for annular eclipses I found an occurence of four in Saros 153 - it starts with four consecutive non-central annular eclipses - something I would have thought impossible - these are then followed by two annular eclipses with no northern limit. The Besselian elements and data from EMAPWIN and the eclipse lists on Fred's web-site agree on this. Saros 103, 64 and 27 all end with 3 consecutive non-central annular eclipses. However if you go back to Saros -31(minus 31) then it ends with no less than 6 (yes SIX) consecutive non-central annular eclipses..... I haven't calculated Besselian elements for this Saros and I can't double-check with Fred's web-site as the dates are too early - I used the data in EMAPWIN, if I get the time I will double-check this.

Anyway all this started when another member of this list - Wil Carton - was kind enough to help me find a copy of Van den Bergh's "Periodicity and Variation of Solar (and Lunar) Eclipses" - it lead me to use EMAPWIN's data to draw the saros-inex panorama that that book contains. However I drew it for 6000 years - van den Begh used Oppolzer and that only gives only 3369 years of data. Interesting as they say. John -- John Tilley

From: Stig Linander

What's a "non-central annular eclipse"?

AFAIK all annulars and all totals are central. Best Regards, Stig.

From: Jean Meeus

Stig wrote: What's a "non-central annular eclipse"?

It is an annular eclipse that has no central line because less than half the anti-umbra of the Moon passes over the Earth. Similarly, a non-central total eclipse is a total eclipse with no central line.

No, not all annular or total eclipses are central. Don't confuse an annular eclipse with a central eclipse! At a central eclipse, for some observers the center of the Moon passes exactly over the center of the Sun.

Between the years 1950-2050, we have the following cases:

1957 Apr 30 non-central annular
1957 Oct 23 non-central total
1967 Nov 2 non-central total
2014 Apr 29 non-central annular
2043 Apr 9 non-central total
2043 Oct 3 non-central annular

So, twice in 1957 and twice in 2043 ! Jean Meeus

From: Stig Linander

Sun, 15 Feb 2004 03:26:48 -0500, Jean Meeus wrote ...

(Continued on page 15)

SETalk

>> What's a "non-central annular eclipse"?

> It is an annular eclipse that has no central line because less than half the anti-umbra of the Moon passes over the Earth.

Thanks for the explanation. I looked in Espenak's "Fifty Year Canon" for a map of the 2014 Apr 29 non-central annular. I suppose the area of annularity is the small half-circle located about 130°E 70°S. Best regards, Stig.

From: Jay.M.PasachoffSENL200403williams.edu

If the definition of central eclipse is as below, rather than because the whole moon crosses the sun within its boundaries, is there a compound name that includes total + annular eclipses? Is there a historical source for the definition? I have been using "central" for "total + annular." Jay Pasachoff

From: Jean Meeus

< Is there a historical source for the definition?
< I have been using "central" for "total + annular."

Well, this is incorrect! Of course, most total or annular eclipses are central, but some of them have no central line, so these rare cases are non-central eclipses; they are total or annular (in a small semi-circular region on the Earth's surface).

Already Oppolzer in his famous Canon der Finsternisse (1887) considered the following possible cases:

p = partial;
t = total (central);
r = annular (central); the 'r' stands for the German 'ringförmig' = 'annular';
r-t = annular-total (called 'hybrid' by some people);
(t) = non-central total;
(r) = non-central annular.

So 'non-central' total and non-central annular are classical expressions in the literature of solar eclipses.

The solar eclipse of 2014 April 29 will be an annular one. But you cannot call it a 'central' eclipse because the eclipse has no central line! The eclipse will be visible as an annular eclipse in a small semi-circular region in Antarctica. Although for observers in that region the lunar disk will be seen completely inside the solar disk, nowhere will the Moon be centrally projected on the Sun. Jean Meeus

From: Stig Linander

What about "(r-t)" - a non-central annular-total. Is that possible? Best regards, Stig.

From: Peter Tiedt

Yes it is - but VERY rarely!

All explained in one of Jean's Morsels books.

Both should be COMPULSORY items on every eclipse-chasers bookshelf ;-) My 2c Peter

From: Chris O'Byrne

> What about "(r-t)" - a non-central annular-total. Is that possible?

(Continued on page 16)

SETalk

When an eclipse goes from annular to total (and vice versa), it goes through a point at which the apparent size of the moon EXACTLY matches that of the sun. And, of course, that point is on the centre line. So, if you want a non-central annular-total, you have to have the antumbra and the umbra brushing the earth, but the point at which the shadow changes between them missing the earth! The closer you are to that point, the smaller the radius of the antumbra and the umbra, so I'm guessing that it's theoretically possible to have such an eclipse. However, it would be of extremely short duration, would occur close to the poles, and would have an extremely short and narrow path. And, there would be two (or three) disconnected zones - there would be (for instance) a zone of annular eclipse, a gap, and then a zone of total eclipse (and possibly, though doubtfully, another gap and another zone of annular eclipse).

Even if it's possible, it's so unlikely that I doubt if it has ever or will ever occur. Chris.

From: Chris O'Byrne

> The closer you are to that point, the smaller the radius of the antumbra and the umbra, so I'm guessing that it's theoretically possible to have such an eclipse.

On the other hand (and my apologies for not thinking of this before hitting the send button on my first message), the curvature of the earth will tend to make that point hit the earth - UNLESS the rate of change of the radius of the (ant)umbra is greater than the effect of the curvature of the earth.

I don't have any numbers to hand to try and figure out if that could be the case. Chris.

From: Wil Carton

Stig, Non-central annular-total eclipses are possible, but extremely rare and as case more theoretical than practical. Jean Meeus found fourty years ago the solution of this question and published it in the Dutch monthly magazine 'Hemel en Dampkring'. The solution is: the umbral cone "sits" during some dozens seconds of time on the Earth's globe like the legs of a rider on his horse; the totality half-cone grazes the sunlit side of the Earth's terminator, while at the same time the annularity half-cone grazes the twilight side. The paper has recently been translated in English and published in Jean Meeus book "More mathematical astronomy morsels, copyright 2002 Willmann-Bell. See its chapter 19, seven pages. Jean calculated the mean frequency of this phenomenon once every 250 million years. Wil Carton

24 years ago....

From: reinder j bouma To: solareclipsesSENL200403aula.com Date: Mon, 16 Feb 2004 18:16:00

Dear umbraphiles, 24 years ago today I observed my first total eclipse from Kenya. Recently I scanned some of my old slides, and I have placed them now at my homepage to celebrate the event. Over the next 24-48 hours to can access them via a link on the frontpage - http://www.shopplaza.nl/astro/ - but later on the page will be linked to only via the pictures section. Don't expect superb quality (slides deteriorate over time!), but I hope the memory brings a smile to your face. best regards, Reinder

From: Dave Balch, Author "Cancer for Two"

That eclipse was my first as well... I tried to find the link but couldn't... can you send us the direct link? Dave

From: reinder j bouma

Oops, small mistake. There was an erroneous link from the main page to the chapter on the Kenya eclipse, but that has now been corrected. We will leave that link a little bit longer active than the anticipated 24-48 hours. You can also click on the 'pictures' button, where you find the Kenya link at the bottom (and where it will remain).

From: Richard Monk

SETalk

Yes I remember that one well - Feb1980, almost to the day! I saw the event on the Kenyan coast just to the north of Malindi which just happened to coincide with a holiday I was spending out there. We went on to Voi later. I managed to record a few precious moments of the eclipse on an old 8mm movie camera but sadly without a sound track. I will look forward seeing any other stills you manage to rescue. Richard

Lunar Eclipse papers

From: Tim Cooper Cc: Patrick Poitevin <solareclipsewebpagesSENL200403btopenworld.com> Date: Tue, 17 Feb 2004 19:17:15

Neville et al Not sure who of you get MNASSA, but if not, a copy of my lunar eclipse 2003 report including your observations, and a paper by me and Mauritz can be seen at the following address. A third paper on eclipse darkness will appear in the April issue. Tim

http://www.saao.ac.za/assa/html/mnassa_2004_feb.html

Saros 0 and EMAPWIN

From: John Tilley To: SolarEclipsesSENL200403aula.com Date: Sat, 14 Feb 2004 19:14:02

I thought this might be of interest - I sent this email to the author of EMAPWIN just now,

Takesako-San

Is there an error in your Besselian elements available with EMAPWIN? - If you look at Saros 0 with EMAPWIN (English version) then it starts with eleven partial eclipses, there is one total, then annular- total, three annular, a non-central annular and then three partial before it reverts back to annular? All the books say that this is NOT possible - once a Saros starts to produce umbral eclipses - it must stay with umbral eclipses - it can't revert to partials and then back to umbral again. If your Besselian elements are correct - then this is very interesting indeed. I hope that your calculations are correct! -- John Tilley

From: luca quick

Dear John Tilley, You noticed that in Saros series 0 three partial eclipses occur after that the first central eclipses of the series have already occured. This behaviour is quite unusual but I think it could be exlpained if you consider that the evolution of the value of gamma is not always monotonic in a Saros series. For most of the eclipses of a Saros series the value of gamma has the same sense of variation, passing from an eclipse to the following one: the decreasing one for odd numbered series (eclipses at the Moon ascending node) , the increasing one for even numbered series (eclipses at the Moon descending node) . But under some circumstances, this sense of variation can be the opposite of the expected one for some consecutive eclipses in the Saros series, after which the sense of variation returns to be the usual one. If this “local” change of behaviour happens for the eclipses located in the first part of the Saros serie at the transition between non central and central ones, you could have some non central eclipses (and than some partial eclipses of large magnitude) “following” some central eclipses. The same could happen in the second part of the Saros series at the transition between central and non-central eclipses, with some central eclipses “following” some non-central eclipses.

I have to say that I have to check my idea. I will post some more message if I discover something new or if I succeed in proving (or invalidating) my idea. Clear skies, Luca QUAGLIA

From: John Tilley

Luca - Thanks for the reply - the behaviour of Saros 0 is VERY unusual - in 6000 years of solar eclipses - there is no other saros like it - in other words its the only occurence of a saros moving from partials to umbrals and then reverting back to partials and then back to umbral eclipses. I have been rereading G van den Bergh's book - initially he was not aware of this phenomena - on page 32 of his book he says ".....the central zone; is entered only once and left only once. In contrast with the inex, it may be said of the saros family that whoever is in stays in" However in the second edition (the English edition of 1955) he analyses it in more detail. On page 80 he says "it is possible that a saros 'firstling' is followed by a gap in the saros series" - in fact "two such gaps are possible" And then he points out that for Saros 58 in the initial series of partial eclipses - gamma decreases, increases and then decreases.....but the eclipses are all partials. He gives a theoretical explanation - the further back you go in time the more likely this phenomena is to occur. As he used Oppolzer (earliest eclipse is -1206) he wouldn't have looked at Saros 0 (first total is -2758). Finally he was so certain that this could not happen - that in the first edition of his book - he assumed that the printer of Oppolzer's canon had made a mistake - van den Bergh apologised in the 1955 edition. Interesting as they say.. Best Wishes - John

From: Jean Meeus

Luca is right. For the successive eclipses in a Saros series, it is indeed possible that Gamma stops moving in one direction (increasing or decreasing), then moves slowly in the opposite direction, then after a few eclipses resumes the "normal" direction.

(Continued on page 18)

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(Continued from page 17)

The interest fact is that this is no longer possible nowadays! It was possible in the past when the eccentricity of the Earth's orbit was larger than presently. So, that "strange behavior" of Gamma will no longer be possible in the future for many centuries, because the Earth's orbital eccentricity continues to decrease. Jean Meeus

From: Gerard M Foley

I ask Do tidal effects tend always to diminish eccentricity, even in the presence of a large satellite, like our moon? Gerry

From: luca quick

As Jean Meeus explained, the variations of the Earthýs eccentricity with time leads to the possibility, in the past, of the occurrence of ýanomaliesý in the structure of Saros series. I made some calculations and I built a large Saros-Inex Panorama which extends far into the past and far into the future. Even if we have to be careful in doing ephemeris calculations for remote epoch in the past or in the future, we may still make the working hypothesis of considering the parameters as ýexactý and see what happens: the results will not be extremely precise, but the overall behaviour will not become completely meaningless, if we donýt push too far the calculations.

The reasoning made for eclipses located at the transitions between non-central and central eclipses (or the opposite case) can be performed for eclipses located at the beginning or at the end of a Saros series. If the circumstances of the strange behaviour of Saros series 0 occured at the beginning or at the end of the Saros, the Saros series would ýswitch offý during several eclipses (just after being born or just before dying), leading to the creations of holes in the series. And I indeed discovered some Saros series, which lived far in the past, where this phenomenon occurred. These are exceptions to the Saros Law which states that, once a Saros series is born, it doesnýt interrupt up to its end. These exceptions were imagined in Professor Van den Berghýs wonderful book. The Saros Law is then valid for the present epoch, the near past and the far future, but not for the far past. For the far future, the Saros-Inex Panorama reveals some interesting features which are also linked, but I think not only, to t e variation of Earthýs eccentricity. Clear Skies, Luca QUAGLIA

From: Jean Meeus

Gerry wrote: I ask: Do tidal effects tend always to diminish eccentricity, even in the presence of a large satellite, like our moon?

The present decrease of the eccentricity of the orbit of the Earth has *nothing* to do with tidal effects. It is caused by the mutual perturbations of the planets.

For instance, while the eccentricities of the orbits of Venus and the Earth are now decreasing, those of Mercury and Mars are increasing.

The eccentricity of the Earth's orbit, which is now 0.0167, will reach a minimum of 0.0023 about the year 29500, then will increase again. See Chapter 33 of my second 'Morsels' book (Willmann-Bell, 2002). Jean Meeus

From: eclipseclatSENL200403comcast.net

I pointed out the shifting gamma back in Jan 24, 2000; it was buried in my (much too long) email about Saroses.

Gamma now shifts very little around January (present epoch). Different solar system planetary orbit values could allow the shift to slow down so much it would reverse direction of shift.

So if a saros was near its start (or end) of life when perihelion was more exaggerated than present it could:

1 near start) 'start/go partial/resume centrals' or 2 near the end) 'end the centrals/go partial/revert to a few - or just one- central and finally progress to a conventional series of dying partials Ray Brooks

Urgent - Klipsi needs photos of Klipsi

From: Klipsi To: SOLARECLIPSES-SENL200403AULA.COM Date: Sat, 21 Feb 2004 20:24:28

hehee ! Weird request here : I need lots of photos of myself ! I got a contact with an editor of a new magazine, he wants to write a major story about me and my eclipse chasing, and he needs photos of me "in action" or "on site" . Problem is , I very rarely take photos of myself ! So, if YOU got a photo of me, taken in Australia, Aruba, Brazil, Malaysia, Thailand, Mongolia, Ecuador, Canada, Germany, Zambia, Costa Rica, Mexico, Antarctica, or anywhere else where I was chasing eclipses (or Leonids or storms or anything else), please send it to me OFF-list, to klipsiSENL200403bluewin.ch . (ideally in Jpeg , 4-6 megapixel original untouched) Not much money to make there, but your name will be there with your photo. And I will love you forever ! ;-) Olivier "Klipsi" Staiger

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For eclipse chasers ... and more

From: KCStarguySENL200403aol.com To: SOLARECLIP-SESSENL200403aula.com Date: Mon, 23 Feb 2004 00:08:23

from digital_astroSENL200403yahoogroups.com where I found it Dr. Eric Flescher (kcstarguySENL200403aol.com), Olathe, KS. USA

**

Message: 3 Date: Thu, 19 Feb 2004 09:38:36 +0800 From: charanischiu <charanischiuSENL200403i-cable.com> Subject: Re: For eclipse chasers ... and more

Dear Anthony, I am also one of the eclipse chaser that on board the 747 to Antarctica for the 2003 Total Solar eclipse, I did take continuous DV video images of the eclipse event, if you all like to see them, you may enter our Hong Kong Astronomical Society web site: http://groups.yahoo.com/group/hkas photos section. Regards kkchiu 040219

On Wednesday, Feb 18, 2004, at 21:38 Asia/Hong_Kong, Anthony Ayiomamitis wrote:

> I remember a few weeks ago reading about the leased plane for the solar eclipse over Antarctica (?) which included a hefty price for observing and imaging the eclipse from a few thousand feet in the air.

> Well, how about this alternative: http://cgi.ebay.com/ws/eBayISAPI.dll?ViewItem&item=3079057375&category=4672

> .... they even accept PayPal.

> Not only do you get the chance to photograph eclipses from 30,000 feet BUT you can also pursue aurora around the world, high-resolution imaging through a thinner atmosphere and certainly never have to worry about cloud cover and other fronts.

> Anyone have specs for a gyro attachment to the EOS 300d and/or Anthony.

Catalog of Lunar Eclipse Visibility

From: Fred Espenak To: SOLARECLIPSES-SENL200403AULA.COM Date: Mon, 23 Feb 2004 20:04:20

Greetings - I have just posted a new catalog of lunar eclipses from 1951 to 2050. What distinguishes it from previous catalogs is that it allows you to determine the visibility of the listed eclipses from any location on Earth.

The catalog is in the form of four interactive Microsoft Excel files which can be downloaded. When you enter your geographic position, each Excel file calculates the Moon's altitude at every stage of every eclipse and determines whether the Moon is above or below the horizon.

This is similar to the Excel tables I developed for the transits of Venus and Mercury last year.

The main web page and explanation (with Excel file links) is at:

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

There is also a key to the Excel tables at :

http://sunearth.gsfc.nasa.gov/eclipse/LEvis/LEviskey.html

Finally, there is a short discussion on how to calculate the Moon's altitude from any geographic location and for any lunar eclipse using parameters listed in the catalogs:

http://sunearth.gsfc.nasa.gov/eclipse/LEvis/LEaltitude.html

You must have Excel 97 or newer in order to read these files. When you download them, Excel should automatically launch and open a file as a spreadsheet where you will be able to enter the coordinates of any geographic location to calculate the eclipse circumstances. The spreadsheets are protected so that you can not accidently delete or edit any information required by the calculations. Only the name and coordinates of the geographic location (in the green box of each spreadsheet) may be modified.

Please let me know about any additional typos, corrections or suggestions. Clear skies, - Fred Espenak

A 19th-Century Book on Ancient Eclipses

From: Craig B. Waff To: HASTRO-L@LISTSERV.WVU.EDU Date: Wed, 25 Feb 2004 07:33:25

In the course of transcribing letters for a planned edition of documents dealing with the mathematical prediction of the planet Neptune, my collaborator, Nick Kollerstrom, came across (among the Adams Papers in the library of St. John's College, Cambridge) a letter from John Herschel to John Couch Adams that is copied below. The letter appears to carry a date of either January or June 23, 1846 (Herschel's handwriting can sometimes be difficult to read). The year date appears to be clearly written, but it seems rather suspicious for several reasons. We have no other evidence that Herschel was personally acquainted with Adams prior to the opti-

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cal discovery of Neptune by Galle and d'Arrest on September 23, 1846. In fact, in a letter to Richard Sheepshanks dated December 17, 1846, Herschel, referring to Adams, says "I know nothing of him."

Furthermore, in the letter Herschel considers Adams as one of "those who have proved themselves competent to great operations in the theory of our system," a reputation that Adams certainly earned after his mathematical prediction of the current position of Neptune was publicly revealed in early October 1846, but most likely not before that date.

The subject of the letter is a book dealing with ancient eclipses that Herschel is sending to Adams. Unfortunately Herschel provides no information on the author, title, or publication date of the work, or even the language in which it was written. He does, however, provide some description of the book's contents, which may provide some clues as to the identity of the book and possibly the correct date of the letter. Nick and I would thus be most grateful if anyone on the list who is familiar with 19th-century scholarship on ancient eclipses can suggest any books published prior to Herschel's death in 1871 that might fit Herschel's description. Obviously, if the work was published after 1846, this would indicate the letter was somehow incorrectly dated.

Here is the text of the letter:

"I take the liberty of sending you a work where if all it contains be correct (and the author seems to have taken vast pains and to be deep in his subject), brings forward a Dignus Vindici Nodus in the lunar theory which is of the highest order of importance, as if I rightly understand him from such a reading as I have been able to give him - the whole fabric of the results derived from the ancient eclipses is brought into question if not altogether demolished.

It is only those who have proved themselves competent to great operations in the theory of our system who can be looked to when such difficulties are raised - If you have seen the work then is no harm done by my sending it - if not, possibly it may be the means of pointing to another open path of research worthy of your powers.

If Laplace has really been mistaken a whole year in the Chaldean Eclipses - what becomes of the lunar acceleration!

But at all events - if it be true as the author really seems to have shewn that the motion of the Moon's node as recognised by theory at present is inadequate to reconcile the older eclipses (even those of the Caesars), and that an empirical correction (which he gives) brings everything into order - Here is ample reason for a thorough reexamination of that part of the lunar theory.

You are quite welcome to retain the book as long as you please. Being a presented copy I cannot ask your acceptance of it."

Conceivably, the letter might have been written in January 1847, and Herschel may have simply forgotten (as we all sometimes do) the change in the year date during the first month of the year. It may be noted, however, that Adams's own first paper on the motion of the moon (particularly the secular acceleration of its mean motion) was published in 1853, and we are not aware of any interest by Adams in lunar theory much prior to that date. Possibly Herschel's letter, and the work described therein, may have been a stimulus of Adams's interest in the subject.

Again, any help in identifying the work described by Herschel will be greatly appreciated. Craig B. Waff

From: Gent van R.H.

Hi, Perhaps some of the references mentioned in Hoouzeau/Lancaster on the ARIBIB website

http://www.ari.uni-heidelberg.de/publikationen/hls/hls11/fulltext/gif.p1199.htm

can help you further.

De Pontecoulant's book on lunar theory might be the book that you are looking for. The Hansen en Hansteen papers in the Astronomische Nachrichten from around the same period specifically deal with the lunar node and ancient eclipses.

From: Craig B. Waff

In response to my previous query, Mike Crowe sent me offline the following entries from his Herschel Calendar:

9656. 1853-2-7 From George Biddell Airy. Royal Observatory, Greenwich. Concerning GA's eclipse lecture and [G.] Seyffarth's claims regarding eclipse observations. ALS 3pp RS:HS 1.224

9659. 1853-2-7 To George Biddell Airy. n.p. Question about whether the effect of Venus on the motion of the moon's node is measurable; this was brought on by reading J. H. Seyffert's writings. LCC 1p inc RGO 6.81.4

9660. 1853-2-7 From George Biddell Airy. Royal Observatory, Greenwich. Believes that the observations that concern JH [see JH's 1853-2-7] with respect to the moon's orbit do not argue for Venusian effects, but GA finds J. H. Seyffert's writings disturbing, too. ACCS 3pp RGO 6.81.5

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The Library of Congress holds a number of works by Gustav Seyffarth (1796-1885), including many on Egyptian hieroglyphics translations, as well as an autobiography. The only astronomical work by Seyffarth at the LC is the following:

Corrections of the present theory of the moon's motions, according to the classic eclipses (St. Loius, 1878) LC Call No.: Q11.S2 vol. 3, 1868-1877

This book appears to fit Herschel's description, but the publication date is seven years after Herschel's death. On the other hand, the call number information suggests that this book might be a collection of pamphlets whose period overlaps the last few years of Herschel' life. Nevertheless, even 1868 is 15 years after the Herschel-Airy exchange of letters cited above. Does anyone know if there was an earlier edition of Seyffarth's book, perhaps around 1853, which was the year when John Couch Adams published his first paper on the secular acceleration of the moon's mean motion? I have already consulted the British Library and US Naval Observatory online catalogues, but they provided no information on any earlier edition. Craig B. Waff

From: Wolfgang R. Dick

> The Library of Congress holds a number of works by Gustav Seyffarth (1796-1885), including many on Egyptian hieroglyphics translations, as well as an autobiography. The only astronomical work by Seyffarth at the LC is the following:
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Craig, The State Library at Berlin lists the following entry: Gustav Seyffarth: Ueber die Sonnen- und Mondfinsternisse der Alten. 1848, 58 p. [Offprint from:] Archiv f. Philologie u. Pýdagogik. 14. 1848

It seems probable that this is the "book" you are looking for.

I found this with the help of the Karlsruge Virtual Catalogue, a very useful interface to search libraries worldwide with a common form. (http://www.ubka.uni-karlsruhe.de/hylib/en/kvk.html)

There are also more astronomical works by Gustav Seyffarth. Regards, Wolfgang Dick

From: Gent van R.H.

Hi, More astronomical papers by Seffarth can be found in Houzeau/Lancaster, cf. the ARIBIB website at http://www.ari.uni-heidelberg.de/aribib/.

Seyffart's _Versuch die astronomischen Tafeln mit den Finsternissen der Alten in Uebereinstimmung zu bringen_, in his _Chronologia sacra: Untersuchungen ýber das Geburtsjahr des Herrn und die Zeitrechnung des Alten und Neuen Testamentes_ (Barth, Leipzig, 1846), mentioned on

http://www.ari.uni-heidelberg.de/publikationen/hls/hls00/fulltext/gif.p0025.htm

may perhaps better fit Herschel's description.

The KVK (http://www.ubka.uni-karlsruhe.de/hylib/virtueller_katalog.html) mentions 3 copies of this work in the UK.

Personal nostalgia about February 26th

From: Bryan Brewer To: SOLARECLIPSESSENL200403aula.com Date: Thu, 26 Feb 2004 18:42:53

Today marks the 25th anniversary of the first time I saw a total solar eclipse. That 1979 event was also the most recent occasion that the path of totality has crossed the continental United States. The date has special meaning because my son Devin celebrated his second birthday on that day.

Nineteen years to the day later (one Metonic cycle) we were toasting Devin's 21st birthday on the cruise ship Galaxy after seeing totality again that afternoon in the Caribbean.

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When Devin turns 40 in 2017, there's another eclipse on Feb. 26th, although this one is annular, visible mostly in the South Atlantic. However, later that year, the continental United States again sees totality on August 21st after a 38-year hiatus. I'm looking forward to another celebration then.

In my book Eclipse (see www.earthview.com), Frank Herbert wrote in the Foreword: "Eclipses, those positive markers of our relative movement through the void, make a superb focal point for our outward vision."

I had no idea at that time how true that statement would become for me. Bryan Brewer Seattle, WA

From: Dale Ireland

Hi Bryan Same for me, 25 years ago this morning was my first view of totality. I bought a C8 from a Bellevue distributor who met my friends and I at Goldendale with the scope in shipping boxes the night before the eclipse and we spent all night assembling it on the 10ftX10ft square we rented from Goldendale Observatory. Along with hundreds of others on their little 10X10 squares (each plot had a power outlet though). A tangle of wires and weirdos. Rockin Roland with his rainbow afro (sports fans will remember him from TV) various cultists dancing and chanting. Guys selling soup cans labeled "canned dark". Lots of us had glow in the dark eclipse shirts and I can still hear the yells one minute before totality "Charge up your shirts, charge up your shirts". Not much else has changed, I still have some slides from that eclipse I haven't finished processing :) Dale

Feb 26 in snowy cold canada

From: KCStarguySENL200403aol.com To: SOLARECLIPSESSENL200403aula.com Date: Fri, 27 Feb 2004 01:49:52

Flying to Michigan, we landed in Winnepeg. On the morning of the 26th, skies were a little cloudy, so we headed West. Our bus stopped besides a highway and we all piled out. It was freezing and there was tons of snow off the side of the road. The sky had a haze of cloudiness. The blue-yellow color on the snow was amazing as we saw some 2 minutes plus worth of totality (my 2nd). I took diamong ring and corona shots. But one of the most interesting pictures was my photo of highway. I took a snapshot of the cars coming down the highway with THEIR LIGHTS ON without stopping. I finally got my slide and put that amazing one on my website too. Dr. Eric Flescher (kcstarguySENL200403aol.com),

From: John Leppert

As well, 6 years ago (1998) yesterday many of us viewed the solar eclipse in the Caribbean...

John Leppert 27 Feb 2004 0704 CST

From: KCStarguySENL200403aol.com

I forgot that this date was the one for the 1979 Canadian eclipse as well as the 1998 Caribbean eclipse that we saw about the cruiseship Galaxy. We saw the eclipse closeup by the erupting volcano Monserat (spelling?). The diamond rings incoming and outgoing sparkled for a remarkably long time. I also remember the multitude of people aboard the ship who were snapping their pictures but also had their lightbulbs go off. (people just never listen or learn I guess). My videos came out well as well as my pictures and they are on my website. Beautiful corona. Going to the various islands was a lot of fun too including seeing the butterfly gardens, the extinct volcano and the rest of the scenery from each island/

Coming soon: solar eclipse photos from Mars

From: Fred Bruenjes To: SOLARECLIPSESSENL200403aula.com Date: Thu, 26 Feb 2004 19:13:35

An interesting tidbit came out of the NASA Mars Exploration Rover news briefing held on Thursday February 26th:

Starting next week is eclipse season on Mars: the shadows of Mars' moons (Phobos and Deimos) will pass over the rovers. NASA is planning to command the rovers to photograph the events! And yes, don't worry, the rovers are equipped with proper ND 5.0 solar filters.

Does anyone know whether these will be partial, annular, or total solar eclipses?

Websites to watch:
http://www.jpl.nasa.gov/index.html
http://marsrovers.jpl.nasa.gov/gallery/press/spirit/

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http://marsrovers.jpl.nasa.gov/gallery/press/opportunity/

Fred Bruenjes

From: eclipseclatSENL200403comcast.net

Fred; I wrote a little something on that topic last summer. The almost three-day-long event described below for Diemos' triple transit (ultra-annular eclipses) would require changing your latitude by approx 125 miles in order to keep its pass dead center through the Sun. However, if you situated yourself properly you would be able to see two successive passes.

I defer to Jean Meeus on this. Jean, in 30 hours of time, Deimos would shift roughly 0.25 degrees (time of Mars' equinox) and the Sun should appear larger than that, approx 0.35 degrees in diamter from Mars. So one could see a transit near the top of the Sun and then 30 hours later another near the bottom (or vice versa) without adjustimg latitude. No? Jean pointed out last year three passes would not be possible without changing your latitude.

Last Summer's Article

Mars' Moons

What would a solar eclipse be like on Mars?

Now that Mars is the superstar for the next few weeks, it is a ripe time for such a question. I am anticipating watching Deimos (Panic) and Phobos (Fear) circle the Red Planet through a telescope nearly the same size as the one Percival Lowell used and am wondering what they would look like from the surface of Mars.

The two moons orbit Mars basically around its equator. With the tilt of Marsý axis this means they both are in lunar and solar eclipse periods near the Mars equinox periods (roughly heliocentric longitude 260 and 80 degrees, corresponds to our June 10 and Dec 10 longitudes) and neither moon is in an eclipse period at the solstices (our March 10 and Sept 10) because they are passing above and below Mars. So, Marsý autumn compared to Earth is shifted a little bit more than a quarter of a circle clockwise as viewed from above the ecliptic. And eclipses would be occurring most often near the start of Mars Spring and Fall. (The precession of the nodes of their orbits is basically locked with the precession of Marsý spin axis.)

Looking at a typical solar eclipse around equinox, Phobos is the larger moon (17 x 14 x 11 miles) and the closer to Marsý surface so it would cover more of the Sun than Deimos. Deimos is 3 times smaller and over 4 times farther from the surface. One darts across the sky in less than four hours with a rather impressive eclipse and the other languishes in the sky for two and a half days with three transits.

Phobos is so close to Mars (3,720 miles from the surface, about the width of North America) that it takes only 7.7 hours per orbit, and races about 4,800 mph, two and a half times the velocity of our Moon. It is the only moon in our solar system that orbits faster than its primary rotates.

So, for Eclipse Day at equinox on Mars you would fly to the equator on your favorite airline, watch the Sun rise in the east a little before 6 am (Mars daytime is almost 12.5 hours long). About 10:05 am, Phobos appearing as a gibbous moon would rise in the WEST, catch the Sun at local noon and set in the EAST before 2 pm. Phobos would be visible as it rises and sets since it would be very very bright, about magnitude minus 9 (also the Mars daytime sky is not as bright as Earthýs.) Phobos would dim and wane in less than 2 hours as it approached the Sun. 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 Marsý equator. Donýt beat me up with my numbersý. I am rushing and packing to catch the plane to our 22-inch mirror at 12,500 feet by the shore of Lake Titicaca.

Deimos would appear as a speck to the eye, only 1.5 arc-minutes in size. It would take about a minute and a half to cross the Sun at local noon; it would resemble a transit. But the approach of Deimos to the Sun would be kind of interesting for a given fixed longitude since it takes about two and a half days from the time it rises till the time it sets. It would rise in the east at about 4 in the morning on day 1 and transit the Sun about an hour after sunrise. It would continue to stay in the sky all day and slowly move to the west. That night it would be basically a bright dot (magnitude minus 5.5) all night. At sunrise on day 2 it would be about 16 degrees from the zenith (quarter phase, but just a bright dot) and then transit the Sun at noon. It would continue to stay in the sky (waning and waxing each quarter phase every 7.5 hours, again just a dot) On day 3 it would transit the Sun about an hour before sunset and then finally set itself at about 8 pm. Day 1 and 3 would transit above and below the Sunýs centerline.

The numbers are quite different right now because Mars is not at equinox but fairly close to winter solstice (north hemisphere). Deimos has no eclipses at all now and Phobos skims Mars at about 60 degrees latitude. So Phobos is farther from eclipse sites, looking smaller, and site speed is less. For the next few weeks, annularity duration has increased roughly 50% to 7 minutes and Phobos would

(Continued on page 24)

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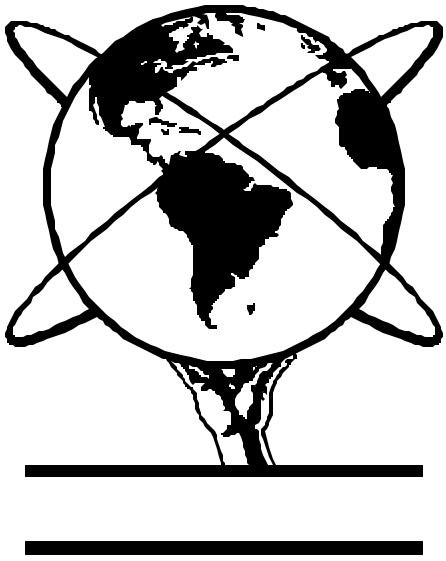
appear slightly less than half the size of the Sun. Raymond Brooks

From: Fred Bruenjes

Ray, Thanks for the response. I did some fiddling with the JPL Horizons ephemeris generator and found that the upcoming eclipses are consistent with your analysis.

Below is a table showing all of the predicted observable Martian solar eclipses for the time period from landing to March 15th. Please note: these are MY calculations, using JPL's tool; they are not from an official source. "AngDia" is the moon equatorial diameter in arcseconds, "MinSep" is the minimum distance between Sun and moon centers in degrees, and "LSolTim" is the local solar time in hours.

The rovers' Pancam camera image scale is 57 arcsec per pixel, so Deimos will be 2.5 pixels across and Phobos 11 to 16 pixels across. The Sun's diameter during this period is around 1230 arcsec, or 22 pixels. So the rovers will be able to resolve the moons, but it won't be a very detailed image.



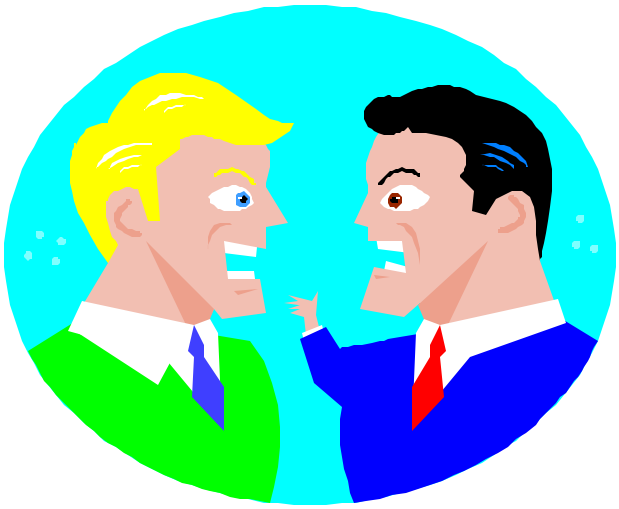
Predicted Martian Solar Eclipses:

Deimos seen from Opportunity rover
Date__(UT)__HR:MN:SC Azim Elev AngDia MinSep LSolTim Type
2004-Mar-04 03:04:30 85.6 67.6 152.5 0.1575 10.5143 Partial

Phobos seen from Opportunity rover
Date__(UT)__HR:MN:SC Azim Elev AngDia MinSep LSolTim Type
2004-Mar-07 02:46:40 88.0 34.6 779.0 0.2003 8.3129 Partial
2004-Mar-08 01:40:15 89.3 8.9 664.9 0.1319 6.5982 Partial
2004-Mar-10 07:36:50 77.4 76.3 908.0 0.0477 11.1092 Deep partial?
2004-Mar-11 14:47:33 271.6 8.0 669.3 0.0652 17.4602 Annular
2004-Mar-12 13:41:19 273.1 33.6 784.3 0.0309 15.7486 Annular
2004-Mar-13 12:30:14 276.5 60.4 880.1 0.1591 13.9583 Partial

Deimos seen from Spirit rover
Date__(UT)__HR:MN:SC Azim Elev AngDia MinSep LSolTim Type
2004-Mar-13 00:05:48 297.5 56.6 150.5 0.1846 13.9471 Partial

Phobos seen from Spirit rover No solar eclipses during time period examined. Fred Bruenjes Ramona, California



TRANSIT OF VENUS

Venus Transit documentation away from your PC

From: Jean-Paul GODARD To: SOLARECLIPSESSENL200403AULA.COM Date: Mon, 09 Feb 2004 21:56:55

Some of us may dream having a printed documentation about Venus transit when being on travel away from the PC.

Based on the original web pages of Fred Espenak http://sunearth.gsfc.nasa.gov/eclipse/transit/TV2004.html And with the agreement of Fred, We are happy to offer you a printable version of the Venus Transit documentation.

You may download it from http://MsEclipse.free.fr The site is in french, click on "transit de venus" and you get an access to the Pdf file (1200ko). Enjoy!

Personnaly, we plan to travel to Sharm el Sheik (Sinai), a wonderful place for diving and observing the sun. (We are both certified divers) Cordialement, Martine & Jean-Paul

Revision of NASA Transit Catalogs

From: Fred Espenak To: SOLARECLIPSESSENL200403AULA.COM Date: Wed, 11 Feb 2004 20:27:28

Greetings, I have just completed a small revision of the NASA Transit Catalogs:

Seven Century Catalog of Mercury Transits:
http://sunearth.gsfc.nasa.gov/eclipse/transit/catalog/MercuryCatalog.html

Six Millennium Catalog of Venus Transits:
http://sunearth.gsfc.nasa.gov/eclipse/transit/catalog/VenusCatalog.html

The revision involves the date of each transit. In the previous versions, the catalogs gave the UT date of Contact I. To be more consistent with other sources as well as with NASA solar and lunar eclipse catalogs, I have now modified the above catalogs so that the dates given are for the instant of greatest transit (when the planet passes closest to the center of the Sun's disk).

Each catalog also features two downloadable Excel 97 files which break the catalog into two pieces (around 90 KB each). The Excel spreadsheets are designed so that you can enter any set of geographic coordinates, and the spreadsheet will then calculate the Sun's altitude for all the transits in the catalog at every contact time as well as at the time of maximum transit. This should be useful for quickly determining whether a transit is visible from a given location. The accuracy is good to 2 degrees or better.

You must have Excel 97 or newer in order to read these files. When you download them, Excel will automatically launch and open a file as a spreadsheet where you will be able to enter the coordinates of any geographic location to calculate the transit circumstances. The spreadsheets are protected so that you can not accidently delete or edit any information required by the calculations. Only the name and coordinates of the geographic location (in the green box of each spreadsheet) may be modified.

The new version of the Excel 97 files also feature calendar dates for the instant of greatest transit rather than for Contact I.

Please email me off the SEML list concerning any additional typos, corrections or suggestions. Sincerely, - Fred Espenak

Janssen or Lockyer observe transit Venus in H-alpha 1874, 1882?

From: Peter Abrahams To: HASTRO-LSENL200403LISTSERV.WVU.EDU Date: Wed, 18 Feb 2004 20:54:51

The transit of a planet across the sun is a spectacular sight through a Hydrogen alpha filter. This summer, Venus will be seen as it approaches the sun, in outline against prominences & the corona.

TRANSIT OF VENUS

Both Janssen and Lockyer were observing solar prominences in the late 1860's, using modified high dispersion spectroscopes. It is quite possible that one or both observed the Venus transits of 1874 or 1882 in the light of hydrogen alpha. But I have not yet found a publication that records this.

Janssen published 'The First Observation of a Solar Prominence Without an Eclipse' in vol. 67 of the Comptes Rendus, 1868. Within a year, he had developed the basic spectrohelioscope.

Janssen was in Japan during the 1874 transit of Venus, using his 'photographic revolver' to make sequential photos, presumably precluding spectrohelioscopic observations.

Lockyer had developed a similar spectroscope for viewing prominences, publishing at the same time.

The transit of Venus is not discussed in:

Levy's biography of Janssen, and Dingle's text on Lockyer, in the DSB.

Cortie, A.L. Sir Norman Lockyer, 1836-1920. Astrophysical Journal 53:4 (May 1921) 233-248.

Lockyer, J. Norman & G.M. Seabroke. On a New Method of Viewing the Chromosphere. Proceedings of the Royal Society of London 21 (1872-1873) 105-107.

Lockyer, J. Norman & G. M. Seabroke. Spectroscopic Observations of the Sun. Philosophical Transactions of the Royal Society of London 165 (1875) 577-586. (illustrations prominence)

A.J. Meadows, Science and Controversy, a biography of Sir Norman Lockyer, Cambridge: MIT, 1972.

This question is motivated by interest in the subject. However, those who read magazines such as Sky & Telescope will have noticed large advertisements for solar hydrogen alpha filters, noting that 2004 is the first time that a Venus transit will be observable in H-alpha. Thanks Peter - Peter Abrahams telscopeSENL200403europa.com The history of the telescope and the binocular: http://home.europa.com/~telscope/binotele.htm

From: John W. Briggs

Dear Peter and List, It would be interesting to check how Charles Young handles the evolving terminology in his classic book, "The Sun." My hunch is that he doesn't use the terms spectrohelioscope or spectroheliograph, for any of the early work.

I still don't completely understand the invention of the "spectroheliograph," which is usually credited to Hale when he was an undergraduate at MIT. I recall off the top of my head that Janssen or someone independently invented the same contraption, at just about the same time. But it was Hale, at Kenwood starting in 1891, who seemed to get so much attention (at least on this side of the Pond!).

I would have guessed that circa 1868, folks like Janssen and Lockyer were simply using high-dispersion spectroscopes, like the wonderful John Browning instrument at Seagrave Observatory. These were not spectrohelioscopes or -graphs, in the Hale sense, because they did not have the coordinated slit motion that Hale first tried years later at MIT. (Can anyone correct me on this?)

The successful Hale instrument at Kenwood was a spectroheliograph, because it was purely photographic. Later, helped by Russell Porter in the 1920s, Hale developed his spectrohelioscope, which was truly a visual instrument, with high-speed slit motion. (As I understand it, he was inspired to monitor the relatively ephemeral solar flares, which were inconvenient to catch photographically.)

Regarding the TofV, I suspect that everyone was so obsessed with getting good white-light timings, that hardly anyone was distracted with the thought of catching the disk incoming in the chromosphere, via a spectroscope. (But I'll be keen to be proven wrong!) --John. John W. Briggs University of Chicago Engineering Center, Yerkes Observatory [Deployed at] National Solar Observatory Voice: 505-434-7098 Sunspot, NM 88349 Fax: 505-434-7029

(Continued on page 27)

TRANSIT OF VENUS

From: John W. Briggs

Thank you, David, for that reference! Did Perry indicate if anyone had success, actually seeing the incoming disk against the chromosphere? It would have been a tricky observation. --JWB. John W. Briggs University of Chicago Engineering Center, Yerkes Observatory [Deployed at] National Solar Observatory Voice: 505-434-7098 Sunspot, NM 88349 Fax: 505-434-7029

From: David Sellers

In a lecture to the Royal Institution on Friday 25th Feb 1876, Father Stephen Perry - who had been a member of the British transit expedition to Kerguelen - said:

"The only spectroscopes taken out for the observation of external contact at ingress [in 1874] were, as far as is known at present, those of Dr.Janssen, Tacchini, Lord Lindsay, and Captain Tupman, and an instrument constructed specially for our Kerguelen station by Mr.Browning" Regards, David Sellers

From: David Sellers

John, In the account of Perry's lecture that I have, he did not mention any results of using spectroscopes during the 1874 transit.

According to Pigatto and Zanini, however, in 'Spectroscopic observations of the 1874 transit of Venus: the Italian party at Muddapur, eastern India' (Journal of Astronomical History and Heritage, Vol. 4, No. 1, p. 43-58 (2001)), Pietro Tacchini observed, for the first time, details of the spectrum of Venus which confirmed the existence of its atmosphere. He demonstrated the validity of spectroscopic observations for determining the exact instant of the contacts. Best wishes, David

From: Peter Abrahams

In addition to Janssen & Lockyer, Carl Frederic Fearnley of University of Christiania in Oslo made detailed drawings of prominences 1872-1873, using a 15cm refractor & spectroscope. Cited & illustrated in: Livingston, W.C., O. Engvold, & E. Jensen. Old and New Views of Solar Prominences. Astronomy 15 (1987) 18-22. ADS lists 20 papers by Fearnley but none seem to be on this topic. Any further information on Fearnley would be most welcome.

>circa 1868, folks like Janssen and Lockyer were simply using high-dispersion spectroscopes not spectrohelioscopes or -graphs, in the Hale sense, because they did not have the coordinated slit motion

Lockyer illustrates one of his instruments in: Spectroscopic Observations of the Sun. No. II. Philosophical Transactions of the Royal Society of London, Vol. 159. (1869), pp. 425-444. This spectroscope does not seem to have any wobbling slit or image scanning mechanism. The user aligned the slit with the edge of the sun, aimed the telescope at the appropriate wavelength in the spectrum, and widened the slit. The images of prominences show that the method was effective, however the images were seemingly built up from smaller fields of view.

Thanks to David for the reference to: Pigatto, Luisa & Valeria Zanini. Spectroscopic observations of the 1874 transit of Venus: the Italian party at Muddapur, eastern India. J.A.H.H. 4:1 (2001) 43-58. On p49, Tacchini's observations of the 1874 transit are quoted: "with the large slit, before the second contact Venus was visible over the chromosphere as in figures 5 and 6 of table VI" Pigatto: "The Italians were the only ones who made spectroscopic observations during the transit. In 1874 December, 'Nature' reproduced most of an article which had appeared in the 'Times' of December 9....."The spectroscope, which forms no part of the equipment of the English expeditions..."

Illustrations reproduced in this JAHH article show Venus superimposed on the solar corona, though without the resolution and field of view of a modern H-alpha telescope. The field of view through the widened slit is narrower than the ~1 arcmin diameter of Venus. But it does appear that the transit of Venus has been observed in H-alpha in the past. Thanks Peter

TRANSIT OF VENUS

Venus Transit -- A Special Trip to a Rare Event

From: Howard L. Cohen To: solareclipsesSENL200403aula.com Date: Wed, 25 Feb 2004 03:18:34

Dear List Members, Subscribers to SEML know that this June Venus will pass in front of the Sun's face for the first time in over 120 years. Few have ever seen this before. Once the upcoming pair of transits pass, no one will observe them again from Earth for more than a century.

Some of you may still be contemplating seeing this once in a lifetime event but have not made or finalized plans.

Unfortunately, it will be extremely difficult or impossible to witness the Venus transit fromthe United States

With this in mind, my wife and I have organized a five-star trip to the Mediterranean to see the transit and the best of Italy, Athens and Crete.

Details about the transit and our tour are at:

http://www.flycapers.com/tours/voyages /2004/2004Transit

This is a limited-space, 15-day escorted tour for no more than 30 people. The tour will be led by knowledgeable local guides and coordinated by professional travel agents.

My wife Marian, a travel specialist with nearly twenty-five years experience in the travel business, will accompany us and I will provide scientific talks and context throughout the trip.

Our travels will take us to beautiful and ancient Florence, Pisa, Sienna, Venice, Rome, Crete and Athens.

We will view the Venus transit from an exquisite resort on Crete, Greece's most beautiful island. This location has excellent prospects of good weather with an 83 percent probability of clear or only scattered clouds according to Jay Anderson's climate statistics.

We are experienced with astronomical tours including recent tours to total Solar Eclipses in the Caribbean, Africa, and Australia. We focus on personal attention, and our guests all returned raving that they have just had the experience of a lifetime.

For more information on the trip, please personally reply to me, or contact my wife Marian at:

352-240-1004 (toll-free 800-446-0705) or marianSENL200403flycapers.com

http://www.flycapers.com/tours/voyages/2004/2004Transit

If you also know someone else who might be interested in this trip, please pass this message along to them. Thanks! Howard --- Howard L. Cohen Associate Professor Emeritus of Astronomy University of Florida cohenSENL200403astro.ufl.edu

Venus history & non-English transit links

From: Chuck Bueter To: HASTRO-LSENL200403LISTSERV.WVU.EDU Date: Wed, 25 Feb 2004 19:32:54

Dear Hastrorians, Two items:

First, in preparation for the transit of Venus, I have compiled original material and many annotated links at www.transitofvenus.org. One of its shortcomings is that it does not have a section dedicated to the history of our understanding of Venus and the Sun. Therefore I appeal to you to recommend appropriate sites for a new section--from ancient astronomy to recent history.

I don't want to put up fences by limiting what you send, but I do ask that your links be focused on the topic and be useful to educators. I am aiming toward a general public audience. As many of you know, R.H. van Gent has posted an excellent transit of Venus bibliography for the more academic historians of astronomy at http://www.phys.uu.nl/~vgent/venus/venustransitbib.htm. I am not

seeking to duplicate his work, though there may be crossover.

Specifically, I ask you to email appropriate, accurate links with a sentence or two describing the content and its significance. Please cite the name of the site's organization or author as well. Send your recommendations to bueterSENL200403transitofvenus.org and include Links somewhere in the subject line.

Second, I have posted only a few links to non-English transit of Venus websites, even though some fine examples are out there. My language shortcomings are showing here. Therefore, I ask you also to send links to qualified non-English sites that relate specifically to transits, again writing a few sentences for a description and citing the source.

You may send all items to me off-list. I will let the list know when many links have been uploaded.

As always, I welcome your comments, corrections, and input. Thanks for your support. Chuck Bueter

Transit in Austria

From: Franz Kerschbaum To: HASTRO-LSENL200403LISTSERV.WVU.EDU Date: Thu, 26 Feb 2004 08:02:38

Hi Chuck! Please find at www.venustransit.at the official austrian node for the transit event with history, tips, science, and links. It is recomended and supported by the Austrian Society for Astronomy and Astrophysics www.oegaa.at. All the best Franz - A.Univ.Prof.Dr. Franz KERSCHBAUM Institut fuer Astronomie der Universitaet Wien Tuerkenschanzstrasse 17 Tel.: +43 (1) 4277-51856 A-1180 Wien Fax: +43 (1) 4277-9518 Austria, Europe Mobile: +43 (664) 60277-51856 Mail: kerschbaumSENL200403astro.univie.ac.at or 8175060 Backup-Mail: franz.kerschbaumSENL200403univie.ac.at URL: http://www.astro.univie.ac.at/~fzi

Venus transit

From: eclipseclatSENL200403comcast.net To: SEML <SOLARECLIPSESSENL200403aula.com> Date: Thu, 26 Feb 2004 10:21:20

What excites me even more than the transit itself in 2004 are the opportunities to see Venus as a full circle of light as the sunlight refracts through the upper cloud layers around the backside of the planet in the days prior to and following the transit.

On March 23 2001, I observed Venus right after sunset at various powers of magnification up to 200x and was able to dimly see 360 degrees around the planet limb. The Sun was 7.6 degrees below the horizon when Venus became lost in clouds about 4 degrees above the horizon. The separation between Venus and the Sun was 12 degrees and seeing conditions were rather poor. I am certain in desert weather conditions with less Sun-Venus separation (meaning less refraction angle) there will be some spectacular views of Venus. This is generally described as the elongation of the "horns of Venus".

I mention this with respect to selecting an optimal site latitude. The best latitude for post sunset views prior to June 8 is about 15 degrees north. That allows minimum sky brightness for maximum Venus altitude above the horizon. (That is lowest Sun for a highest Venus) The best latitude for pre-sunrise views after June 8 is about 15 degrees south. And a latitude near the Equator would be a decent compromise for both views.

My most spectacular view of this apparition was my mid total eclipse view in Nov 1994 with Venus 38 degrees high, a cull circle of bright white with ýsun-settingý arcs of red on the limb opposite the Sun. Separation was only 5 degrees, the eclipse occurred only 13 hours after Venus inferior conjunction. It was was one of the most amazing, stunning views in my life, surpassing the TSE itself. I regretted 'wasting' half of my time on the eclipse. Raymond Brooks

Venus Saros

From: eclipseclatSENL200403comcast.net To: SEML <SOLARECLIPSESSENL200403aula.com> Date: Thu, 26 Feb 2004 10:24:22

VENUS TRANSITS

TRANSIT OF VENUS

A Venus transit across the Sunýs face is a ýonce, or twice, or zero in a lifetime chanceý event. With the Venus transit coming in 2004, I recently looked at the transits as a saros series. They are quite surprising and different than a solar eclipse saros.

As everyone knows, Venus transits come in a pair 8 years apart for one node and then more than a century later at the opposite node another pair occur which are also separated by 8 years. We are presently lying within four Venus saros series. This is true for our present epoch but evolves into quite another thing over the next few millennia.

The first surprise I found was that transits for both nodes migrate south across the Sunýs face in their saros! It was so surprising that I simply did not believe my results whatsoever. How could this be? In disbelief, I started checking the transits in Dance of the Planets which has quite an accurate planet program. It is accurate enough to show the Venus-Jupiter occultation in June in 1BC so transits should be easy enough to simulate. It showed the same south migration for all series but shook my faith even more as it showed one of the saros series to regress to a north migration in midlife while the other few series continued marching south!! It also showed the saros that regresses has a much much longer lifespan than the others. This made me an even more of a Doubting Thomas, so I searched Amazon.com and pull up a book named "Transits" by none other than, Jean Meeus. OK, methinks, now we can get to the bottom of this and see what is really happening.

Two days later, I open the book before the UPS delivery man is even back in his truký. On page 12 Meeus describes Venus successive transits qualitatively, "It's remarkable that the displacement of the chord is southwards at both nodes of Venus' orbit" Wow!

His analysis continuesý."These numbers show that after several millennia the southward displacement may change into a northward one." Needless to say, I became an instant believer. (Put your hand on the orrery, say, "I believe, yea verilyý.")

Meeus goes on, "These changes are due to the secular variations of the elements of the orbits of Venus and Earth (inclination, eccentricity, longitudes of nodes and apsides)"

He has elements for Venus out to year 3956 which agree quite well with Dance of the Planets.

Obviously, I had expected the descending node transits to migrate in the direction opposite to the ascending node transits over the saros. If one migrated up then the other should migrate down. I did not expect it merely because it is true for a solar eclipse saros but rather because for changing parameters like inclination of the Venus orbit, early (or late) arrival of Earth (or of Venus) at the Venus node, etc. the effect seen at one node would appear as the converse at the other node. But that was simplistic. Yes, a single effect like early arrival of Earth at the nodes would drive each transit in opposite directions but other factors can contribute larger effects.

One of my first speculations about the saros differences was, "Could it be a periodicity effect with the barycenter of the solar system (about which all bodies orbit) that could appear to offset the Sun at transit time and change the intersection with Venus?" Jupiter flip-flops from the left side of the Sun-Venus-Earth line to the right side every other transit within a saros. So that did not seem to be a factor.

Why does Saros B start from the top of the Sun, migrate down to the midpoint (gamma of zero) in year 4928 and then start regressing back up? Yet the then concurrent opposite saroses Saros C and E (years 5512 and 5520) on the opposite node do not regress?

As an example, a parameter change that would affect the saros migration in the same direction for either node is Earthýs orbit eccentricity. The Venus nodes favor the same heliocentric longitude as the line of the Earth apsides (perihelion, aphelion). They are not exactly in line but that is not important, at least they favor it . As long as aphelion (slow half of orbit) is fairly close to a node, a reduction in eccentricity will decrease the time Earth spends on that half of the orbit but increase the time it spends on the perihelion half. So Earth would start arriving earlier for one node but later for the other node. That would make each opposite-node saros migrate in the same direction.

Because of these differing effects it is impossible to have a simple rule like, "All ascending node transits migrate down." An example is to look at just one node that has a pair of transits 8 years apart. For a pair like that, one saros transit has a positive gamma while the other has negative (across the Sunýs face). If the parameter of Earth to Venus distance varied greatly by coming closer within that hypothetical saros, then the next high pass would look higher and the next low pass would look lower. To simulate,

(Continued on page 31)

TRANSIT OF VENUS

spread two fingers high and low in front of one eye and then bring them closer to your eye. The high finger appears higher and the low finger appears lower due to foreshortening perspective.

Here is a look at how each of the four Venus transit saros series alternate. I labeled them A,B,C and D in the order which follows from today.

Saros A & B transits are 8 years minus 2.5 days apart.

Saros C & D transits are 8 years minus 2.25 days apart.

The June 8, 2004 transit I call Saros A. 8 years later on June 6, 2012 is Saros B.

These are both at the Venus descending node.

105 and a half years pass to transition to the as cending node.

And on Dec 11, 2117 is a transit in Saros C at the ascending node.

8 years later on Dec 8, 2125 is Saros D.

Then 121.5 years pass to transition to the descending node which returns to Saros A in the year 2247. So the transition time from opposite orbit pairs differs, 105.5 years vs. 121.5 years.

The transit increment within a Venus Saros is 243 years 2.15 days for the descending node saros series but a tenth of a day longer for the ascending node saroses.

Saros B is the odd saros that migrates down to the center of the Sun over 4500 years and then regresses back up!

Here is the life of Saros B:

Year

554 skims top of Sun (gamma +1)

797 decreasing gamma

1040, 1283, 1526, 1769

2012

2255

2498

2741

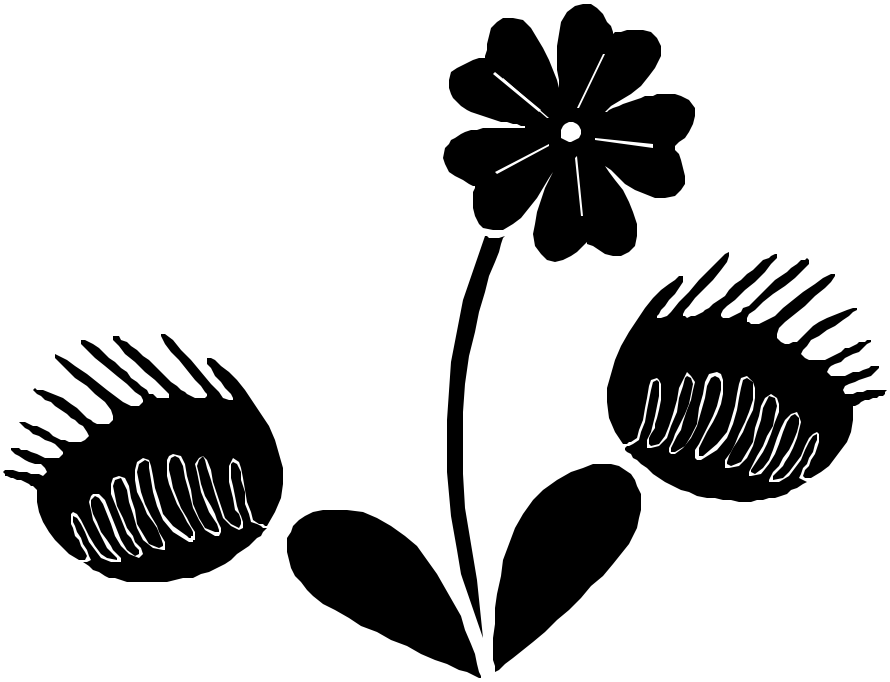
2984

3227

3470

3713

3956



(Continued on page 32)

TRANSIT OF VENUS

4199

4442

4685

4928 gamma near zero ý near center of Sun

5171 gamma still near zero ý near center of Sun

5414 now gamma starts increasing and migrates back north

5657

5900

6143

6386

6629

6872

7115

7358

7601

7844

8087

8330

8573

8816

9059

9302

9545

gamma of +0.5
and continues on.

The other strange thing about Saros B is how long it survivesýtwice as long as the others.

Saros A, C, D and E have lives of about 6,000 years but Saros B is about 12,000.

Saros A (the one in June 2004) is old and only has five more transits remaining; it ends in year 3219.

Saros B is young per above.

(Continued on page 33)

TRANSIT OF VENUS

Saros C in December is young now and so will not die until year 7464.

Saros D in December is very old now with only three transits remaining (2125, 2368, 2611).

Saros E in January is born in year 5512 to replace Saros D only twelve transit increments later (12 x 243 years)

So Saros A and D die soon leaving only B and C for two transits each then Saros E begins in year 4297. Raymond Brooks Star Engineering

From: Fred Espenak

I've posted a catalog of all Transits of Venus from 2000 BCE to 4000 CE at:

http://sunearth.gsfc.nasa.gov/eclipse/transit/catalog/VenusCatalog.html

I also identify 6 transit "saros" series operating during this period which are numbered 1 through 6. These are analogous to the series that Ray Brooks calls A (=3) , B (=5) , C (=6) , and D (=4).

You can also see a diagram of series 4 at:
http://sunearth.gsfc.nasa.gov/eclipse/transit/image/VenusTransit04b.GIF

Finally, the above catalog is available as a pair of Excel files which calculate the altitude of the Sun at each stage of every transit at given set of geographic coordinates. You will find links to these Excel files near the bottom of:

http://sunearth.gsfc.nasa.gov/eclipse/transit/catalog/VenusCatalog.html

Much of this is based on Jean Meeus' excellent book "Transits" which I enthusiastically recommend to it as essential reading to anyone interested in the subject. Fred Espenak

PS - A similar Seven century catalog of Mercury Transits is available at: http://sunearth.gsfc.nasa.gov/eclipse/transit/catalog/MercuryCatalog.html

From: Fraser Farrell

Fred, The OpenOffice 1.10 and 602Pro spreadsheets also work successfully with your catalogues. So I can view them on any of my computers :-)

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?

HYBRID 2005

2005 ships NOT in the path:

From: Jen Winter - ICSTARS Astronomy To: SOLARECLIPSESSENL200403aula.com Date: Sun, 15 Feb 2004 18:34:15

Industry update on availability of ships -

In our research, we have found the following ships to have declined solicitations to access the intercept the path of totality in April, 2005:

If the vessel is not chartered, the cruise line has to feel that changing the regular itinerary to include the eclipse will be sure to keep the ship filled to the capacity they require. Ships therefore, aren't likely to change existing itineraries. When chartering a vessel, the itinerary has to be approved by the operations staff. They have to approve the route, the fuel usage, speed between the islands and safety risk factors to the expedition.

Remember that the path of Totality near Tahiti is about 1000 nautical miles from Papeete, Tahiti. As they usually sail between 10 and 15knots, that's as much as 100 hours or 4 days each way. Bora Bora is the opposite direction from the eclipse. Also, most of the ships which sail around Tahiti sail less than 10 km between islands very close together. The Marquesas islands are also north of Tahiti, and not between Papeete and the path.

The path does run close to the islands, Oeno and Pitcairn. Neither of these islands have an airport and ships don't embark from there. French Polynesia includes the Tuamotu Islands that runs southeast of Tahiti towards the path. At the end of the Tuamotu islands is the Gambier Archepelago. The ships need to navigate these islands, where the waters are shallow and jutty rather than open seas. Ships need to know the waters and reduce speed to do so. In these islands, a few scattered among them have tiny little dirt-style runways. There are, perhaps 3 islands with airports between Papeete and Pitcairn which receive flights as regularly as every week. The ships which visit these islands do so about once or twice a month for commerce only. French Polynesia ENDS at Gambier Island, before Oeno and Pitcairn Island. This island group is in British waters.

To make matters worse, ships out of Tahiti charter Saturday to Saturday. The eclipse occurs on Friday. A ship cannot make the trek back to Papeete in 1 day. Ships don't charter for 9 days or 12 days. They only charter by the week.

SHIPS NOT AVAILABLE TO VIEW THE ECLIPSE:

Princess Cruises - Tahitian Princess - scheduled for an itinerary in the Cook Islands, southwest of Tahiti. Not interested in re-positioning.

Windstar Cruises - Windstar - Owned by Holland America, a corporate decision was made to re-position the Wind Star OUT of Tahiti before the 2005 season. There are not enough regular weekly bookings to substantiate them keeping the ship there. They will not allow a charter of the ship to the eclipse path either.

Bora Bora Cruises - Tia Moana and Tu Moana - The fuel range of these smaller yachts is too short. They looked at reducing passenger capacity and pre-shipping fuel to islands between Papeete Tahiti and the eclipse, but the final span and roughness of the seas which would need crossed were beyond the capacity of the two yachts.

Tahiti Aggressor - Very-much beyond the range of the Aggressor.

Clipper Odyssey - Already chartered to visit Guam by another group.

Captain Cook - Reef Escape - Operates in the Fiji region only. Not available for repositioning.

There are a few more ships left... but not many.
Jury is still out on:
MS Paul Gauguin (a 5-star cruise-line with all outside cabins and 50% with verandas)
- The 315 passenger, Gauguin must be chartered in-whole for an obscene amount of money, but is a good option. Aranui III (A cargo/passenger vessel which operates in the Marquesas islands)
- The 200 passenger Aranui III also must be chartered, but requires compensation for lost cargo sales so fares would be much higher.

(Continued on page 35)

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This is why the eclipse trip via Tahiti will be more expensive. Don't expect to find a 1-week cruise either out of Tahiti or Galapagos.

Just keeping the group informed and educated. Clear skies, jen

AstronomyVacations 2005 Hybrid Eclipse Cruise

From: Geoff To: SOLARECLIPSESSENL200403AULA.COM Date: Tue, 17 Feb 2004 23:14:01

I received this from AstronomyVacations regarding their cruise to the total hybrid eclipse in 2005, and though it may be of interest to some, as cabins are almost sold out on this cruise.

>From: "Roy Mayhugh" <mayhughSENL200403iwvisp.com>
>
>This eclipse cruise update for the 2005 hybrid eclipse covers inventory availability and price increase details that go into effect 1 March.
>
>INVENTORY - Cabins are selling fast. Some categories are already full and others are nearly so. Here are the details:
>
>Category O (double occupancy insode cabin) - Full
>Category L (superior inside cabin) - Full
>Category II (single occupant cabin) - Full
>Category GG (single occupant cabin) - 1 cabin left
>Category D (outside deluxe cabin) - 3 cabins left
>Category C (single occupant Jr. suite) - 1 cabin left -
>
>Space availability is good for all other categories. I am taking waitlist reservations for full categories with very good probability of success.
>
>INTRODUCTORY PRICES - expire 29 February. Early booking prices go into effect 1 March. This is an increase of $350 to $1,000 per person depending on category.
>
>A $500 deposit is required to make a reservation. Deposit if fully refundable if you cancel prior to December 3, 2004.
>
>Please visit the website for further details http://astronomyvacations.com
>
>CONTACT INFORMATION - I am available Mon to Sat between 8am and 6pm Pacific Time (GMT-8hrs). Toll free number is (888) 412-5317. From outside the US call +1 760 446 0050. Give me your call back number and I will return the call. Website is http://astronomyvacations.com Postal Address: 701 Perdew Ave., Ridgecrest, CA 93555. cst#: 2049910-40 Cheers, >Roy

2005 Total-Annular Eclipse

From: Roy Mayhugh To: solareclipsewebpagesSENL200403btopenworld.com Date: Thu, 19 Feb 2004 18:43:34

This eclipse cruise update for the 2005 hybrid eclipse covers inventory availability and price increase details that go into effect 1 March.

INVENTORY - Cabins are selling fast. Some categories are already full and others are nearly so. Here are the details:

Category O (double occupancy insode cabin) - Full
Category L (superior inside cabin) - Full
Category II (single occupant cabin) - Full
Category GG (single occupant cabin) - 1 cabin left
Category D (outside deluxe cabin) - 3 cabins left

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Category C (single occupant Jr. suite) - 1 cabin left-

Space availability is good for all other categories. I am taking waitlist reservations for full categories with very good probability of success.

INTRODUCTORY PRICES - expire 29 February. Early booking prices go into effect 1 March. This is an increase of $350 to $1,000 per person depending on category.

A $500 deposit is required to make a reservation. Deposit if fully refundable if you cancel prior to December 3, 2004.

Please visit the website for further details http://astronomyvacations.com

CONTACT INFORMATION - I am available Mon to Sat between 8am and 6pm Pacific Time (GMT-8hrs). Toll free number is (888) 412-5317. From outside the US call +1 760 446 0050. Give me your call back number and I will return the call. Website is http://astronomyvacations.com Postal Address: 701 Perdew Ave., Ridgecrest, CA 93555. cst#: 2049910-40 Cheers, Roy

Eclipse stamps 2005

From: barr derryl To: SOLARECLIPSESSENL200403aula.com Date: Wed, 25 Feb 2004 04:48:15

Recently I emailed the Pitcairn Island Philatelic Bureau regarding the possiblity of a 2005 eclipse stamp. Here is the reply I received. Perhaps if others on and off the List indicated an additional interest, the whole enterprise might be spurred along.

- Original Message -- From: Latitude Fulfilment Limited Sent: Tuesday, February 24, 2004 8:09 PM Subject: FW: Eclipse stamps 2005

Dear Derryl, Thank you for your email regarding the possibility of an eclipse stamp.

The 2005 programme has yet to be decided and this will be finalised by August of this year. Your timing is good therefore and we will certainly put the topic forward for consideration by our stamp production team.

Kind regards, Russell Watson Pitcairn Island Philatelic Bureau

-Original Message-From: Pitcairn Islands Philatelic Bureau [mailto:stampsSENL200403pitcairn.gov.pn] Sent: Wednesday, 25 February 2004 11:19 a.m. To: Latitude Subject: FW: Eclipse stamps 2005

Great maps for 2005 eclipse

From: klipsi@bluewin.ch To: SOLARECLIPSES@AULA.COM Date: Fri, 27 Feb 2004 14:26:46

Fred , you got some competition there ;-)

http://www.imcce.fr/ephem/eclipses/soleil/avril2005_generalite.html

From: Daniel Fischer

So ... is Oeno's NW coast inside the track of totality or not? This map - at http://www.imcce.fr/ephem/eclipses/soleil/avril2005_oeno.jpg - seems to imply it is, but http://www.imcce.fr/ephem/eclipses/soleil/avril2005_Iles_Pitcairn__Ile_Pitcairn0.html does not list any totality time for "Oeno". Whatever point on this uninhabited (AFAIK) island they mean by that, of course; perhaps it refers to the geometrical center.

In any case I doubt people will be *on* that island which seems to be exceedingly difficult (and dangerous) to reach - but two of the three cruise ships will probably be not from from Oeno, according to the published itineraries. Daniel

(Continued on page 37)

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From: klipsi@bluewin.ch

yes, this is why it is urgent (please) that Fred shows us his detailed maps ;-)

From: Michael Gill

Glenn Schneider discussed the viability of Oeno's extremities as a viewing location on the SEML last August.

Quote: "My posting, though was 'NOT' saying Oeno would make a good site for those (like me) who want to bask in the Umbra. But for a VERY near grazing totality and long duration diamond ring (i.e. for those interested in limb events) this might be an attractive possibility." (See SENL Vol. 8, Issue 9, page 13).

http://solareclipsewebpages.users.btopenworld.com/SENL_files/Senl200309.PDF

If you check out some of the Oeno imagery taken from the ISS that Glenn has on his web site...

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_05/ISS004-E-6792.jpg

http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_05/ISS002-E-10013.jpg

...The reef-like formations surrounding the island do not look inviting as eclipse observing stations for any path-edge observers. Central-liners like me won't be interested in heading there at all.

Also, I cannot believe that any cruise-ship operator would deliver passengers to such risky areas. Moving equipment from a ship to the island to the reef would be a challenge.

The MV Discovery has no plans to make any call at Oeno according to the itinerary posted on the Mayhugh web site:

http://www.mayhugh.com/discoveryitinerary.html

Although spectacular Baily's Beads are likely to be seen from Oeno, those interested in that phenomenon can head to Panama for much less cost and get a nice display.

So, as an observing location, I think the extremities of Oeno Atoll are a dead loss. The only point in going at all might be to scout it as a potential location for the 2019 TSE when it WILL be inside the track of totality!

Note that the following map may cause confusion with the longitude values: http://www.imcce.fr/ephem/eclipses/soleil/avril2005_oeno.jpg

The correct longitude of Oeno Atoll is 130 degrees 44 minutes west. The latitude lines on the map appear to be correct. Cheers, Michael Gill

Having booked our 2005 eclipse cruise - now what?

From: Daniel Fischer To: SOLARECLIPSESSENL200403aula.com Date: Thu, 26 Feb 2004 16:29:13

And so it happened: Yesterday we booked the "Discovery" for 6 people, including Kris Delcourte, Georg Dittie and myself - for most of us the first luxury cruise, and certainly the first one for chasing an eclipse. What we would appreciate would be some helpful suggestions from experienced ship-based umbraphiles: What can be done from a modern medium-size cruise ship in terms of photo- and videography and what should one not even bother trying? As this eclipse is total for some 30 seconds at best, there will be really no time for experimenting then. Any links to detailled reports of ship-based total eclipse observations on the web or references to helpful articles in (accessible) astronomical magazines would be appreciated! Thanks and regards, Daniel

From: Jay.M.PasachoffSENL200403williams.edu

Daniel-- The only eclipse cruise I was on was the 1977 one on the Fairsea in mid-Pacific. You can see some of our images at www.

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williams.edu/astronomy/eclipse. Look under Archive in the keywords at the left. We had two inertial guidance platforms and a contraption with a heavy counterweight at the bottom rented from a Hollywood movie house; I was assured that it had been used for filming Mutiny on the Bounty. The contraption stabilized things a bit. You wouldn't have inertial guidance platforms, but the gyros we used at the Antarctic eclipse flight would be useful. You should be able to steady things enough to get some good short exposures. And wide-angle views with the sweep of the horizon should be spectacular. Jay Pasachoff

From: Mike Simmons

There are a number of devices available in the movie industry for stabilizing cameras, no matter how rough the ride. If anyone's interested I can provide a little information since my son works in specialized camera support equipment in the industry. Note, however, that a stabilizing pan-tilt head will cost around $1000/day to rent so these things don't really fit in the usual eclipse chaser's budget. Mike Simmons

From: Donald Watrous

Joe Rao wrote a great article on the 8/11/1999 eclipse we viewed from the Regal Empress in the North Atlantic. It's online at

http://www.mreclipse.com/TSE99reports/TSE99Rao.html

David Levy, on the same ship, wrote about it too. It appeared on the Sky and Telescope website (entitled "A Seaborne Spectacle") but is no longer there. It was probably in the magazine too.

I didn't do any serious photography, but bought copies of the ship's photographer's shots. I also bought a copy of a videotape someone produced on board. Don

From: Jen Winter - ICSTARS Astronomy

The world is littered with thousands of avid ship-board eclipse chasers. I'm sure someone will chime-in at any moment.

The best shots I ever saw by a ship-bound photographer was from our partner, David Anschutz. He imaged the Aruba '98 eclipse prime focus on an 8" "suitcase dobsonian". He used ASA 200 slide film and had exposures up to several seconds that were awesome. He was on the Fascination. By using a dob, there isn't any guidance, but you also are positioning the scope easily by hand while looking through the viewfinder.

Also, a client and friend of ours, Jacques Guertin has a prototype design he's been working on for a smaller-scale gyro. We hope he'll have the plans or finished gyro done so that the tool can be available for other chasers to use. If I find out about any news, i'll share them. jen

From: Dale Ireland

Jen I was able to take some nice images from the deck of the Fascination off Aruba with 400 film at f/4. Even caught Jupiter.
http://www.drdale.com/eclipses/images/jupsun.jpg

Others at http://www.drdale.com/eclipses/solar.htm

It was steady enough even though there was some wind and moderate chop. Dale

From: Gerard M Foley

> The world is littered with thousands of avid ship-board eclipse chasers. I'm sure someone will chime-in at any moment.

Here I am!

> The best shots I ever saw by a ship-bound photographer was from our partner, David Anschutz. He imaged the Aruba '98 eclipse prime focus on an 8" "suitcase dobsonian". He used ASA 200 slide film and had exposures up to several seconds that were awesome.

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This is an image taken 1973 from the French car ferry "Massalia" in the Atlantic off the coast of Mauritania:

http://home.columbus.rr.com/gfoley/ecl73-2.jpg

Here is the February 26, 1998 TSE taken from "Monarch of the Seas" in the Caribbean near the island of Monserrat:

http://home.columbus.rr.com/gfoley/ecl002-2.jpg

And four versions from August 11, 1999 aboard "Marco Polo" in the Black Sea:

http://members.tripod.com/~gerardfoley/ecl-1a.jpg
http://members.tripod.com/~gerardfoley/ecl-2a.jpg
http://members.tripod.com/~gerardfoley/scanprt2t.jpg
http://members.tripod.com/~gerardfoley/scanprt1t.jpg

The last cited is probably the best of these four.

All these pictures were taken with an 800mm. f8 Vivitar lens on a Pemtax Spotmatic 35mm camera. The setup is here:

http://home.columbus.rr.com/gfoley/ecl15.jpg

In the Atlantic the ocean was fairly calm. In the Caribbean it was quiet. In the Black Sea the sea was absolutely flat.

During a peculiar cruise to nowhere, in an abortive attempt to see Comet Kohoutek (the "brightest comet of the century"), in "Queen Elizabeth 2" it was apparent that the ship's stabilizers required the ship to be moving to be effective (steerage way). Thus in rough or moderate seas, the ideal for an eclipse is to have the ship moving fairly fast until a short time before totality, and then to shut off the engines (to reduce vibration), allowing the ship to move on its own inertia, so the stabilizers will be effective. As soon as QE2 stopped, it began to roll quite a bit. I do not recall for certain whether we kept "Massalia" moving during totality, but I think we did. On the later cruises the sea did not cause the ship to roll perceptibly, so the stabilizers were unnecessary. Gerry

From: Dale Ireland

Nice images Gerard! Have you ever seen an eclipse from dry land? Your 73 image has that "antique" look to it. Dale

From: Jean-Paul GODARD

You may have a look to our cruise for TSE2002. Even if the sky is covered, you get a great experience. http://MsEclipse.free.fr Cordialement,

From: Gerard M Foley

Thanks. Yes, I have been on land in 1932, 1954. 1963, 1970 and 1972 :

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

I thought I had a page devoted solely to 1970, but I can't find it, even with Google, so it must have disappeared. If anyone is specially interested I can probably dig it up and post it somewhere again.

My pictures from a ship in the Indian Ocean in 2002 are comparable with those from the Gaspe in 1972 - cloud, cloud, cloud!

From: KCStarguySENL200403aol.com

Daniel and the rest, During the 1973 and 1998 cruises, I took nice pictures. I adjusted the camera to go for speed. Of course I had a lot more time in 1973. During that time, I was able to take pictures of the darkening during the last sends of totality (which took a lot

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of coordination and using another camera while I had another set to photograph the eclipsed sun). I also had a taperecorder for the sound since video was not possible then. Most of my 1973 pics came out with only a couple of sun-balloon like ovals due to the swaying of the sea. However on land, I was able to to videos of the looming darkness in 1998 to combine both visual and sound. Unlike 1998, I decided to spend the whole time in 1999 and 2001, taking just video (except for 4 shots with my digital camera that made it into Astronomy magazine). I have more information about my 1973 and 1998 exploits and pictures on my site. I know that you have seen shadow bands before (I remember you had some great video or pictures - do you still have them on a website somewhere - please let us know to have a look again). I don't think that anyone has ever seen shadow bands at sea, so that you will have to scrap that. I think you should concentrate on taking a video (you can leave that in place) and maybe an experiment or photographs. I loves both cruises and plan to try for a cruise for 2006 most likely. Wish I could go on the 2005 one.

Satellite images of area from Oeno to Galapagos

From: Klipsi To: SOLARECLIPSES-SENL200403AULA.COM Date: Sat, 28 Feb 2004 04:58:24

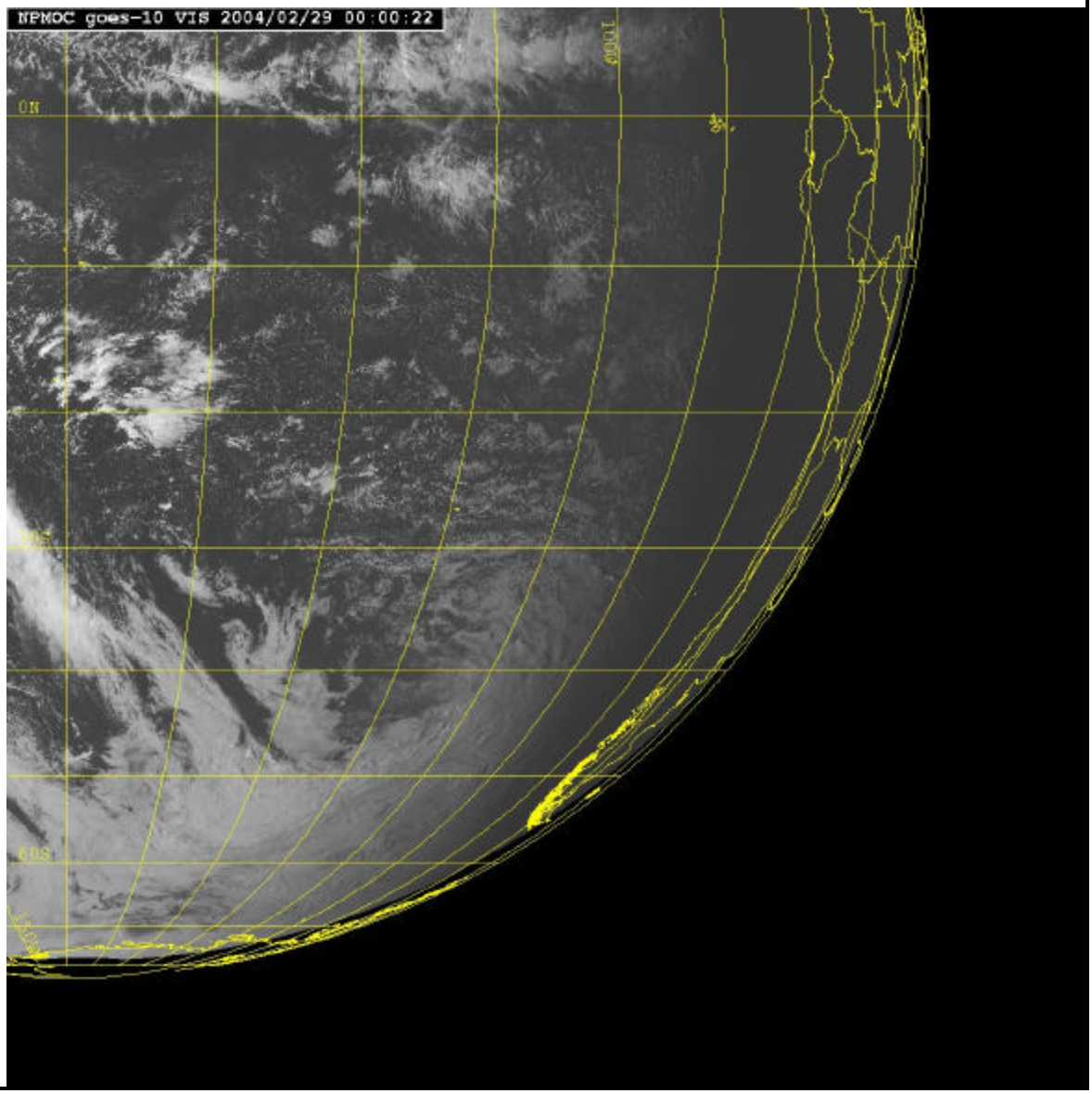
a tool for the 2005 HSE >

found a nice satellite image of the area in the southeast pacific ocean including the path from oeno to galapagos.

infrared
https://metoc.npmoc.navy.mil/sat/goes_d/ir/goes_d_ir.jpg

visible
https://metoc.npmoc.navy.mil/sat/goes_d/vis/goes_d_vis.jpg

watervapor
https://metoc.npmoc.navy.mil/sat/goes_d/wv/goes_d_wv.jpg



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Bright Venus very close to 2005 HSE

From: klipsiSENL200403bluewin.ch To: SOLARECLIPSESSENL200403AULA.COM Date: Fri, 27 Feb 2004 15:09:15

just saw that Venus will be just a couple of degrees away from the Sun during totality in April 2005. Could be quite spectacular sight. When was there an eclipse lately with Venus so close ? anybody got an image to share ?

another question : we say totality for total eclipses, and annularity for annular eclipses. is it correct to speak of hybridity for hybrid eclipses ???

From: Jean Meeus

< We say totality for total eclipses, and annularity for annular eclipses. Is it correct to speak of hybridity for hybrid eclipses ???

Certainly not.

For a given place within the track, the eclipse is either total or annular, hence giving rise to totality or annularity. Nothing else. Jean Meeus

From: Dale Ireland

Hello With what accuracy can the location of the transition point from annular to total be calculated? There must be some uncertainty in the lunar limb profiles for that moment, the true diameter of the photosphere, the true distance from the Earth's center for positions along the path, etc etc. Dale

TSE 2006

US citizens can go to Libya!

From: Harvey Wasserman To: SOLARECLIPSESSENL200403AULA.COM Date: Thu, 26 Feb 2004 18:25:24

WASHINGTON (AFP) - The United States moved closer to normalized relations with Libya by ending a 23-year ban on travel there to reward Tripoli for quitting its quest for weapons of mass destruction

http://story.news.yahoo.com/news?tmpl=story&cid=1511&e=3&u=/afp/20040226/wl_afp/us_libya_travel_040226151656 Great timeing! Yay! Harvey Wasserman

From: Peter Tiedt

And - there are still 50% of the seats on the Wild Frontiers Sahara Eclipse Adventure available .... 4m4s of totality

From: Dale Ireland

I will never give Moamer Kadhafi any of my "tourist" dollars. Dale Ireland

From: solareclipsewebpagesSENL200403btopenworld.com

Dear All, As mentioned many and many times: The SEML is NO media to post messages on political issues and situation. Please not not post messages of this kind and do not reply on these kind of messages. The initial post is as guilty as the reply post.

If you travel to any country, as you do for your personal care and health, check and post country issues with other media, but do not use the SEML.

Keep messages solar eclipse related. If you doubt about the contents, send your posting first to me. Thank you for your understanding. Best regards, Patrick

Joanne & Patrick

The sole Newsletter dedicated to Solar Eclipses

WE'RE ON THE WEB AT
http://www.Mr.Eclipse.com/SENL/SENLinde.htm
and
http://solareclipsewebpages.users.btopenworld.com

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

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

HOW TO SUBSCRIBE:

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

Sjoerd Dufoer noaa10564, Belgium