

# SOLAR ECLIPSE NEWSLETTER

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### The Solar Eclipse Mailing List

The Solar Eclipse Mailing List (SEML) is an electronic newsgroup dedicated to Solar Eclipses. Published by eclipse chaser Patrick Poitevin.

[solareclipsewebpages@btopenworld.com](mailto: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 (listserv) 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](mailto: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 listserv. Only subscribers can send messages.

## The sole Newsletter dedicated to Solar Eclipses

Dear All,

First of all Happy New Year from us. We hope you will have clear skies and of course a good health!!!

Again another Solar Eclipse Newsletter. That makes 3 issues in about one week. We had the December issue, the Special Edition, and this one. Good we had some days of, because there was as well the update of the Solar Eclipse WebPages.

Anyway, we hope you enjoy.

This issue is a bit smaller than the two previous editions. But that is normal, with the Special Edition we had.

Many of us started their preparation for



the Annular Eclipse and the Total Eclipse of this year. Some of you are looking forward to observe the Mercury transit and of course both Total Lunar Eclipses. What else can we look forward to?

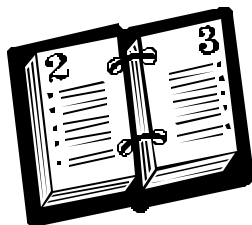
As you will notice on the picture contributions in this SENL, we are still in the African atmosphere. We thought, we share the amount of solar eclipse related collectables. Please keep those reports and pictures coming.

Do not forget TOTALITY DAY on \* February in the Open University of Milton Keynes. Be there!!! We are looking forward to meet you all.

Best regards, Joanne and Patrick

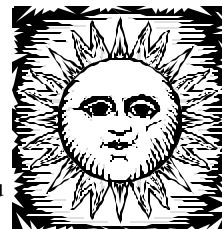


## SECalendar



Dear All,

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



### MAY 2002

For the whole Solar Eclipse Calendar, see <http://solareclipsewebpages.users.btopenworld.com>

January 01, 1386 New Years total solar eclipse in Europe. January 01, 1443 Partial solar eclipse on New Years day. January 01, 1489 Annular eclipse on New Years day. For Papua New Guinea was this eclipse visible on January 2. January 01 1805 Partial solar eclipse on New years day. January 01, 1824 Annular eclipse on New Years day. January 01, 1889 New Year's Day Eclipse. Illustration with direct telegraph line from San Francisco to New York for the astronomers has been published in many eclipse books. January 01, 2215 Annular eclipse of January 01, 2215 will be visible on New Years eve December 31, 2214 for the Southeast Pacific. January 01, 2272 Partial Solar Eclipse on New years day January 01, 2272.

January 01, 1981 Minor planet (2761) Eddington 1981 AE. Discovered 1981 January 1 by E. Bowell at Anderson Mesa. Named in memory of the great English astronomer and physicist Arthur Stanley Eddington (1882-1944) on the occasion of the centennial of his birth. Eddington made fundamental contributions to studies of stellar structure and relativity, and he was also a lucid and indefatigable popularizer of astronomy. (M 7621) Eddington served as president of the International Astronomical Union from 1938 to 1943. He is also honored by a lunar crater. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

January 02, 1424 The annular eclipse on January 2, 1424 was visible on New Years day for the South pacific, east of New Zealand.

January 02, 1892 Death of Sir George Biddell Airy (1801-1892), British Astronomer Royal from 1835 to 1881. President of the Royal Society from 1871 till 1873. Calculated distance to the sun and observed transit of Venus, etc. (ref. DD 7/98, Rc 1999). Born in Alnwick, Northumberland on 27 July 1801. Died in Greenwich London on 2 January 1892. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

January 03, 1976 Minor Planet (2490) Bussolini 1976 AG. Discovered 1976 January 3 at the Felix Aguilar Observatory at El Leoncito. Named in memory of Juan A. Bussolini, S.J. (1905-1966), solar physicist, director of the Observatorio de Fisica Cosmica de San Miguel and a member of the commission of the International Year of the Quiet Sun. He was also an important benefactor to the Felix Aguilar Observatory. (M 8800) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

January 04, 1989 Minor planet (4499) Davidallen 1989 AO3. Discovered 1989 January 4 by R. H. McNaught at Siding Spring. Named in honor of David {Anthony} Allen {1946-1994}, staff astronomer at the Anglo-Australian Observatory (AAO). Following his Ph.D. from Cambridge University, Allen held research fellowships at the Hale Observatories and the Royal Greenwich Observatory. In 1975 he became one of the "founding members" of the scientific staff of the AAO, initially as a research fellow. He has remained as one of the pillars of that establishment ever since, having become the only permanently-appointed research astronomer. Notable for his extraordinarily wide interests across all astronomy, from the solar system to observational cosmology, his main contributions have been in the field of infrared instrumentation and its applications. He developed the radiometric method for determining asteroid diameters and recently discovered several new infrared "windows" in the atmosphere of Venus. Allen is also a leading figure in public education in astronomy, contributing to many radio and TV programs and the author of many popular articles and several books. (M 17980) Citation prepared by R. D. Cannon at the request of the discoverer. Obituaries published in Publ. Astron. Soc. Aust., Vol. 12, No. 1, p. 139-141 (1995); Observatory, Vol. 114, No. 1122, p. 250-252 (1994); J. Br. Astron. Assoc., Vol. 104, No. 5, p. 259 (1994); Q.J.R. Astron. Soc., Vol. 36, No. 2, p. 173-174 (1995). Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg. David Allen wrote, together with Carol the book <Eclipse>.

(Continued on page 3)

## SECalendar

January 05, 1935 Extreme solar eclipse. Magnitude of the eclipse was 0.0012. The maximum is only 0.12 percent of the solar diameter. This solar eclipse was <visible> in the South Pole sea.

January 05, 1989 Minor planet (4498) Shinkoyama 1989 AG1. Discovered 1989 January 5 by T. Seki at Geisei. Named in honor of the solar physicist Shin Koyama, who has served as a professor at Kagawa University for 30 years. Born in Kyoto in 1927, Koyama has retired from public life in March 1991. (M 18001) This planet was first (MPC 17980) accidentally named Koyama. This name, however, was already assigned to planet (3383). Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

January 07, 1976 Minor Planet (2062) Aten 1976 AA. Discovered 1976 January 7 by E. F. Helin at Palomar. Named for the Egyptian sun god. This object is distinguished among the Apollo asteroids as the first discovered to have a semi major axis less than 1 AU and a period less than one year. (M 4420) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

January 08, 1587 Johannes Fabricius was born. Fabricius was a Dutch astronomer who discovered the sunspots and Sun rotation. Died in 1615. (ref DD. 01/00)

January 08, 1642 Death of Galileo Galilei. Discovered his eye illness in January 1637. He could not read or write without technical help in June of the same year. Before the end of the year he was completely blind. His sight was eclipsed forever. Ref. De jonge Galileo, Davidfonds nr. 341. After he became blind, Galileo was permitted to have his 2 friends (Vincenzo Viviani, geometrician, and Evangelista Torricelli, a physicist) to live with him until he died on 8 January 1642. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

January 08, 1868 Sir Frank W. Dyson was born in Ashby de la Zouch, Leicestershire UK. Dyson proved that Albert Einstein (1879-1955) was right about light being bent by gravity. Co-writer of the book Eclipses of the Sun and Moon, 1937 (with R.v.d.R. Woolley). Died in 1939 on 25 May off the coast of South Africa while on a sea voyage from Australia. He was an active member of several expeditions to study total eclipses of the sun and in 1906 he published a book in which he discussed data he had obtained on these occasions on the spectrum of the solar chromosphere. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

January 09, 1201 <Within the sun there was a black spot as large as a date> (ref BAA 12/00)

January 10, 1829 Birth 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)

January 12, 1983 Minor planet (3819) Robinson 1983 AR. Discovered 1983 January 12 by B. A. Skiff at Anderson Mesa. Named in honor of Leif J. Robinson, editor of 'Sky and Telescope'. Robinson's career as an observer began with a series of planetary drawings and observations of the rapidly changing variable stars in the Orion Nebula. He worked at the Griffith Planetarium in Los Angeles before joining the staff of the magazine in 1962 as an editorial assistant, and he succeeded the late Joseph Ashbrook {see planet (2157)} as editor in 1980. Robinson has been an active promoter of professional-amateur cooperation in astronomy, and retains interests in solar-eclipse viewing and bird-watching. (M 16246) Citation provided by D. H. Levy, S. J. Edberg and J. K. Beatty at the request of the discoverer. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

January 12, 1986 Death of Ludwig Biermann, German astro physicist. His research of comet tails made him predicting the solar wind in 1951 with success. He described models of the corona and chromosphere of the sun s. (ref DD 01/00)

January 13, 1983 Minor Planet (5862) Sakanoue 1983 AB. Discovered 1983 January 13 by T. Seki at Geisei. Named in honor of Tsutomu Sakanoue (1921- ), professor emeritus of Kyushu University whose specialties included agricultural meteorology, countermeasures against meteorological disasters, medical meteorology and rainmaking. An amateur astronomer with particular interests in atmospheric seeing, the green flash and shadow bands, he contributed to the popularization of astronomy as an advisor at several science museums. He also served as vice president and president of the Oriental Astronomical Association. (M 32788)

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## SECalendar

Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg Name proposed by the discoverer following a suggestion by S. Murayama, T. Sato and A. Fujii.

January 14, 0484 "A year before his death there were various omens. There was an eclipse of the Sun which was so pronounced as to turn day into night and the darkness was deep enough for the stars to become visible; it occurred in the eastern horn of the sign of Capricorn. And the almanacs predicted another eclipse that would occur after the first year. They say that such events that are observed to happen in the heavens are indicative of things that happen on the earth; so that these eclipses clearly foretold us of the privation and departure as it were of the light of philosophy." Refers to a total solar eclipse in Athens of 14 January AD 484. From: Marinus, Greek philosopher, *Life of Proclus*. Quoted in *Historical Eclipses and Earth's Rotation*, by F Richard Stephenson, Cambridge University Press, 1997, page 368.

January 14, 0484 Athens "The eclipse of Sun was so pronounced that it turn day into night and the darkness permitted to see stars..." Marinus Neapolitanus. *Life of Proclus*, chapter 37 (ref. PG01/00)

January 14, 1742 Death of Edmond Halley (1656-1742 or 1743) in Greenwich, British astronomer. Famous for comet Halley. Observed the so called Bailys' beads before Francis Baily (1774-1844). Royal Astronomer Royal from 1720 till his death. The Royal Society mentioned 14 January 1742 or 1743. Ref. Rc 1999. Born in Haggerton near London on 8 November 1656. Ref. *The Bibliographical Dictionary of Scientists*, edited by David Abbott, 1994.

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

January 15, 1948 Death of Henri Alexandre Deslandres (1853-1948) in Paris, French physicist and astronomer. Did spectroscopic Solar research. Designed independent but at the same time from Hale the spectra heliograph. (Rc 1999)

January 15, 1976 German satellite Helios 1 passes the Sun at only 48 million km.

January 16, 1135 "Shao-hsing reign period, 5th year, 1st month, the first day of the month. A man named Ch'en Te-I predicted that the Sun should be 8-1/2 tenths eclipsed with the beginning of loss in the initial half of the hour of the sxu. (These predictions) were verified by observation." Refers to a partial solar eclipse of 16 January 1135. From: Sung-shih (Chinese). Quoted in *Historical Eclipses and Earth's Rotation*, by F Richard Stephenson, Cambridge University Press, 1997, page 253.

January 16, 1135 Lin-an Shao hsing reign period, 5th year, first month, the first day. Ch'en Te-I predicted that the Sun should be eclipsed..." Sung-shih, chapter 81 (ref. PG 01/00)

January 17, 1938 William H. Pickering, American astronomer died. He studied several solar eclipses. Born in 1858. (ref DD 01/00)

January 17, 2447 Three total solar eclipses visible within a strip of the Pacific Ocean south of Hawaii over a period of only 4.3 years: 17 January 2447, 12 May 2450 and 1 May 2451. Approximate geographic longitude and latitude is 159 to 156 degrees West, 10 degrees North. (Ref. JM 09/99)

January 18, 0120 "On the day wu-wu, the 1st day of the 12th lunar month, the Sun was eclipsed; it was almost complete. On the Earth it became like evening. It was 11 degrees in the constellation of Hsu-nu [the Maid]. The woman ruler [ie the Empress Dowager] showed aversion to it. Two years and three months later, Teng, the Empress Dowager, died." Refers to a solar eclipse of 18 January AD 120. From: the Hou-Han shu ("History of the Later Han Dynasty"). (China). Quoted in *Encyclopedia Britannica* CD 98, and in *Historical Eclipses and Earth's Rotation* by F Richard Stephenson, Cambridge University Press, 1997, page 237.

January 18, 0120 Lo yang "Yuan ch'i reign period, 6th year, 12th month, day wu wu. The Sun was eclipsed. It was almost completes. On Earth, it was like evening..." Hou-han-shu, chapter 28. (Ref PG 01/00)



## SECalendar

January 18, 0120 Of the 14 summits 8000 meter, 9 did witness a total eclipse of the sun: Everest, Kangchenjunga, Lhotse, Makalu, Cho Oyu, Dhaulagiri, Manaslu, Annapurna and Shisha Pangma. This is the most summits in totality between year 0 and 3000. Ref PA 6/00

January 18, 1898 Total solar eclipse on the Everest. 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). Totality is also on the 8000 meter summits Lhotse and Makalu. Ref. PA 5/99

January 19, 0301 From China <Within the sun there was a black vapour.> (ref BAA 12/00)

January 21, 1292 "Chiih-yuan reign-period, 29th year, first month, day chia-wu. The sun was eclipsed. A darkness invaded the Sun, which was not totally covered. It was like a golden ring. There were vapours like golden earrings on the left and right and a vapour like a halo completely surrounding it." Refers to an annular eclipse of 21 January 1292. The halo is caused by ice crystals in the Earth's atmosphere. From: Yuan-shih . Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, page 258.

January 22, 1969 Launch Orbiting Solar Observatory 5, American spacecraft for Solar research.

January 23, 0901 Antakyah "We observed the solar eclipse at Antakyah on the 23rd of Kanun al thani in the year 1212 of Dhu al Qarnayn... more than half of the Sun was eclipsed..." Al Battani (Ref. PG 01/00)

January 24, 1004 Cairo "The was in the afternoon of monday the 29th of the month of rabi al-Awwal in the year 394 of al-Hijrah..." Al Zij al Kabir al Hakimi. (re f. PG 01/00)

January 24, 1544 Rainer Gemma observed the solar eclipse by using of solar projection. (ref DD 01/00)

January 24, 1882 Harold Delos Babcock was born in Egerton, Wisconsin. Babcock was an American solar astronomer who proposed in 1961 that the sunspot cycle was the result of the Sun's differential rotation and magnetic field. His most important contributions were to spectroscopy and the study of solar magnetism. Died in 1968. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

January 24, 1914 Sir David Gill, Scottish watchmaker and astronomer died. Designed the value of a helio meter. Born in 1843 on 12 June. He retired in 1906, for health reasons, and lived in London until he died of pneumonia on 24 January 1914. Observed the transit of Venus in 1874. Ref. The Bibliographical Dictionary of Scientists, edited by David Abbott, 1994.

January 24, 1925 Capt. F. B. Littell took the company of 19 crew and scientists to an altitude of 4500 feet with a Zeppelin. Of the scientists, there were E. T. Pollock, G. H. Peters, H. H. Barnes, J. A. Jennings, and C. B. Watts, of watts limb charts fame. It was a normal eclipse expedition but on a platform unique among them all. (ref. S and L E observations 1943-1993, F. Graham). This nearly turned out to be tragedy in American aviation. The airship in question was the Los Angeles, which at that time was the largest in the world. Lifting off from Lakehurst, New Jersey en route to a pre-selected eclipse viewing site near Nantucket Island, the Los Angeles was suddenly hit by a fierce northwesterly wind gust that actually caused the air-ship to nearly topple over on its side. Fortunately, the Los Angeles was quickly righted upwards and was able to fly off on its flight to totality. Ref. SENL 02.02

January 24, 1925 Famous New York Eclipse. Southern limit passed somewhere through Manhattan: exact line between 95 and 97th Streets. Observers stationed at every intersection between 72nd and 135th Streets. Path New York and Connecticut clear skies. Millions of people witnessed the Eclipse. This was also the eclipse that gave rise to the now popular term "Diamond Ring Effect." Since the southern edge of totality crossed upper Manhattan, those who were lo-cated just outside the eclipse track saw a single bright bead of sunlight persist through the maximum phase of the eclipse, while the inner corona was also visible. In the January 26th, 1925 edition of The New York Times, under the headline "Scientists Missed Sun's 'Diamond Ring' " we read in part: " . . . spontaneously called 'the diamond ring' by numbers of observers in New

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## SECalendar

York, and this term, hitherto unknown to astronomy, was apparently fixed forever as a technical term in the literature of the subject by Saturday night." Ref. SENL 02.02

January 24, 1925 Mabel L. Todd also was passionately interested in total solar eclipses, and traveled to a dozen of them at a time when expeditions often lasted for many months. He photographed the New England total eclipse of January 24, 1925 from an airplane, and some sources credit him with being the first astronomer to photograph the sun's corona from an airplane. Richard Sanderson 6/97. As per Joe Rao: There were actually more than two dozen aircraft that were in the skies over the Greater New York area during this eclipse and many carried photographers. One of those was astronomer Willem J. Luyten who served as a reporter/photographer for the New York Times and witnessed the eclipse at an altitude of 10,000 feet over the Long Island Sound shoreline of Connecticut. Luyten later noted that one of the difficulties that he had in photographing the totally eclipsed Sun was not being able to see what the frame number in his camera was registering. "I could only snap the shutter, advance the film and hope that my next pot-shot would not end up on the previous frame Ref. SENL 02.02

January 24, 1982 Minor planet (2602) Moore 1982 BR. Discovered 1982 January 24 by E. Bowell at Anderson Mesa. Named in honor of Patrick Moore {1924- }, astronomer, broadcaster, and writer. For some years director of the Lunar Section of the British Astronomical Association, Moore has been most energetic and successful in popularizing astronomy. He is author of many books and has regularly presented 'The Sky at Night' on BBC television since April 1957. In 1967 he was awarded the Order of the British Empire. (M 7157) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg. Patrick Moore observed many solar eclipses.

January 24, 1992 Minor Planet (6731) Hiei 1992 BK. Discovered 1992 January 24 by Y. Kushida and O. Muramatsu at Yatsugatake. Named in honor of Eijiro Hiei (1931- ), professor at Meisei University and professor emeritus of the National Astronomical Observatory of Japan. A solar physicist best known for his research on white-light flares, Hiei was the fourth director (1982-1992) of the Norikura Solar Observatory, where he conducted coronagraphic studies. (M 28090) Name proposed by the discoverers following a suggestion by T. Sakurai. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg Hiei was also one of the guest speakers at the conference SEC2000.

January 25, 1736 Birth of Joseph Louis Lagrange (1736-1813), French mathematician and astronomer. Described the 3 points, later called Lagrange points. (Ref. Rc 1999)

January 25, 1742 Edmund Halley, British astronomer died. During an eclipse in England, is the first to report the phenomenon later known as Bailey's Beads; also notes bright red prominences and the east-west asymmetry in the corona, which he attributes to an atmosphere on the Moon or Sun. Halley observed from London (John Flamsteed (1646-1719) observed from Greenwich). Halley also probably draw the first eclipse map. Born in 1656.

January 25, 1908 The corona of the Sun was photographed for the first time (not during a TSE).

January 25, 1944 Hergé, with his famous Adventures of TINTIN (Kuifje) published his book Prisoners of the Sun in 1949. The Total Solar Eclipse described in this book is the one in South America on January 25, 1944.

January 28, 1611 Born of J. Hevelius, Polish amateur astronomer, discovered the libration of the Moon.

January 29, 1932 (2485) Scheffler 1932 BH. Discovered 1932 January 29 by K. Reinmuth at Heidelberg. Named in honor of Helmut Scheffler (1928- ), staff member of the Heidelberg Königstuhl Observatory and professor of astronomy at Heidelberg University (1963-1991), on the occasion of his retirement. He has made important contributions to the fields of radiation transfer in the outer solar atmosphere, atmospheric seeing and the structure of the interstellar medium. In collaboration with H. Elsässer {see planet (4385)}, Scheffler has written the well-known textbooks Physik der Sterne und der Sonne and Physics of the Galaxy and Interstellar Matter. (M 18643) Name proposed and citation prepared by G. Klare and L. D. Schmadel. Endorsed by E. Bowell, who found the key identification involving this planet. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

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## SECalendar

January 30, -0280 (0281 BC) solar eclipse in Babylon (ref. PG 01/00)

January 31, -0253 (0254 BC) solar eclipse in Babylon (ref. PG 01/00)

January 31, 1310 "On the last day of January at the 8th hour of the day at Avignon there was an eclipse of the Sun, and it was eclipsed in an extraordinary manner, and was notably sparkling. There appeared as if at nightfall a single star, a second was the opinion of the crowd. Then a remarkable semicircle was seen and it lasted until past the night hour." . Refers to a total solar eclipse of 31 January 1310. From: Ptolomaei Lucensis Hist. eccles.. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, page 382.

January 31, 1972 Launch of HEOS 2 (US). Research of magneto sphere, solarwind and the interaction between. Ref. DD 2/99.

January 31, 1981 Minor planet (7324) Carret 1981 BC. Discovered 1981 January 31 at the Harvard College Observatory at Harvard. Named in honor of Philip L. Carret (1896- ), on the occasion of his 101st birthday and the 80th anniversary of his graduation from Harvard University. Passionately interested in solar eclipses, Carret has traveled the globe for most of the century in search of them - from Borneo to Siberia, from Baja to Kenya and from Prince Edward Island to Indonesia. Dean of American investment management firms and legendary stock picker, he created one of the first mutual funds in the U.S., Pioneer Fund, in 1928 and helped to found the mutual fund industry. He has been generously concerned about education, and about the environment and wildlife. (M 31025) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg. Mr. Carret passed away in 1998. Michael saw him on the cruise ship 'Veendam' at the February 1998 TSE wearing his 'I-saw-Halley's-Comet-Twice' t-shirt! Not bad going to be eclipse-chasing at age 101! Ref. SENL 02.02

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

Best regards, Patrick and Joanne

[solareclipsewebpages@btopenworld.com](mailto:solareclipsewebpages@btopenworld.com)

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



## SEDates

### Totality Day 2003 reminder

From: [solareclipsewebpages@btopenworld.com](mailto:solareclipsewebpages@btopenworld.com) To: SOLARECLIPSES@AULA.COM Date: Thu, 12 Dec 2002

Dear All, May I remind you on the Totality Day meeting at the Open University of Milton Keynes on Saturday 8 February 2003. Closing date for lectures and presentations is 20 December. We have currently speakers from England, Ireland, Germany, Belgium and Czech Republic.

Overseas are encouraged to combine their trip with Astrofest in London on Friday. I will send some links for accommodation and a full program shortly. Send us a mail if you need more info for trading and poster sections. Best regards, Patrick

### Laura Appleton at the entrance of TD2001



## SEDates

### Totality Day Preliminary Program

Dear All, Please find herewith the preliminary program for the second edition of Totality Day which will take place on 8 February 2003 in the Open University of Milton Keynes (UK).

As you will notice, there is still some space if you want to give a presentation, paper or poster. Please send us an e-mail with the details. Thank you.

For accommodation and maps to get to the Open University, please visit our webpages at:

[http://solareclipsewebpages.users.btopenworld.com/TD\\_files/TD2003.html](http://solareclipsewebpages.users.btopenworld.com/TD_files/TD2003.html)

### TOTALITY DAY 2003 - (PRELIMINARY) PROGRAM

08h00 Doors open. Entrance Main Reception of Berrill Building (<http://www.open.ac.uk/>)

10h00 Opening TD2003 by Prof. Dr. Barrie W. Jones (UK)

10h05 Eclipse Calculator On-Line by Chris O'Byrne (Ireland)

10h20 Unusual eclipse captures by Daniel Fischer (Germany)

10h50 Break

11h30 Recording Shadow Bands on video by Eric Strach (UK)

11h50 The Total Solar Eclipse from Singelele Camp, SA by Joanne Poitevin (UK)

12h00 Lunch (Berrill Café is open for sandwiches, drinks or pack-lunch)

14h00

14h10 The 2002 TSE in Botswana by Barrie W. Jones (UK)

14h20 The 2003 ASE and visibility from Scottish locations by Sheridan Williams (UK)

15h00 Measuring the Diameter of the Sun during Solar Eclipses by Eric Jones (UK)

15h20 TSE2002 as seen from the Australian Outback by Derek Hatch/Mike Foulkes (UK)

15h40 Break

16h10 Solar/Background Fluxes in the visible and IR by Alan Rideley/Brian Sheen (UK)

16h30 The Messina December 4, 2002 white-light corona by Dr. Voyto Rusin (Czech R.)

17h10

17h30 Posters

17h55 Closing TD2003 by Joanne and Patrick Poitevin (UK)

20h00 Doors closed

See you on the 8th February.

PS: For those who want to combine with Astrofest in London on Friday 7th February, please let us know.

From: [solareclipsewebpages@btopenworld.com](mailto:solareclipsewebpages@btopenworld.com)

Sorry for the bad link. The correct webpage link for Totality Day 8 February 2003 is

[http://solareclipsewebpages@users.btinternet.com/TD\\_files/TD2003.html](http://solareclipsewebpages@users.btinternet.com/TD_files/TD2003.html)

See you there. Patrick

From: Patrick Poitevin

Dear All, Apologise for the bad links. Must be the beer from the past days ...

The correct link for Totality Day 8 February 2003 at the Open University of Milton Keynes is:

[http://solareclipsewebpages.users.btopenworld.com/TD\\_files/TD2003.html](http://solareclipsewebpages.users.btopenworld.com/TD_files/TD2003.html)

Once again, sorry for any inconvenience and frustrations!!! Best regards, Patrick

From: Barrie W. Jones

If you are driving to the Open University then beware that the local map on the website below can prove to be a bit lacking in detail.

If you are travelling along Standing Way (H8, A421) then look out for the roundabout named 'Kents Hill', which is where the H8 crosses Brickhill Street (V10). If you are heading eastwards then turn right, and if westwards then turn left.

If you are travelling along Groveway (H9) then look out for the roundabout named 'Walton', which is where the H9 crosses Brickhill Street (V10). If you are heading eastwards then turn left, and if westwards then turn right.

The east (main) entrance to the Open University is off

*(Continued on page 9)*



## SEDates

Brickhill Street, between the Kents Hill and Walton rounabouts. Happy New Year Barrie W Jones

From: Geert Vandenbulcke

How "easy" is it to get from central London to MK by train, ie how much time does it take, are trains frequent or not?  
Geert Vandenbulcke

From: Barrie W. Jones

Very easy - there are about three trains per hour, from Euston, the fastest being Virgin trains that take about 45 minutes. There is a bus from Milton Keynes station to the Open University, but it's FAR better to get a taxi - ask for the Walton Hall campus of the OU, and you will be delivered to the Berrill Building near the east entrance, which is where the meeting is being held. Barrie W Jones

From: solareclipsewebpages@btopenworld.com

Trains for Milton Keynes do leave Euston station in London and takes less than an hour. They leave very frequent (at least one an hour). You can check railtrack.com for time tables and durations. Best regards, Patrick

From: Geert Vandenbulcke

Thanks PP and Barrie, don't know if I can make it yet though... Geert Vandenbulcke

## SEScannings

### Poitevin Interview in magazine

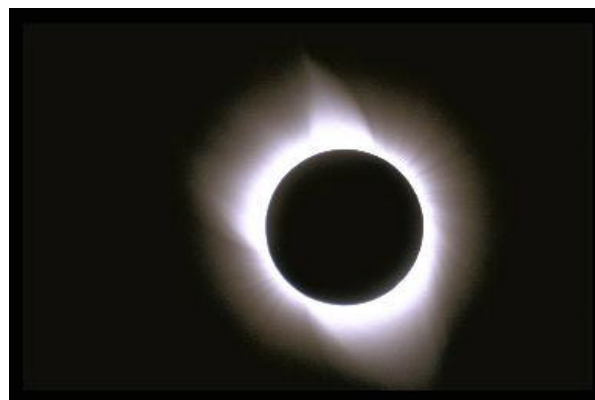
From: Fred Espenak To: SOLARECLIPSES@AULA.COM Date: Fri, 13 Dec 2002 18:32:07

The October 2002 issue of "Les Dossiers De Science & Vie Junior" contains an article/interview with our very own Patrick Poitevin. The article is in French which I do not read.

If someone on this mailing list is willing to translate the article, I would be happy to send them a copy for that purpose. - Fred Espenak

From: Geert Vandenbulcke

Fred, I can translate it for you if still needed. Geert Vandenbulcke **TSE19941  
103 by PP**



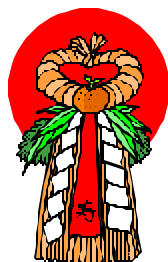
### New IRC chanel about eclipses

From: Francisco A. Rodriguez Ramirez To: lista eclipse <SOLARECLIPSES@AULA.COM> Date: Mon, 30 Dec 2002 18:13:38

New IRC chanel about solar and lunar eclipses from Spain.

Chanel: #eclipse  
Server: irc.irc-europa.org

Happy New Year ! Francisco A. Rodríguez Ramírez www.astroeduca.com



### UK TV programme 23 Dec 2002

From: Mike Murphy To: SOLARECLIPSES@AULA.COM Date: Fri, 20 Dec 2002 13:02:16

Those of you in the UK might be interested in viewing or tepe recording this:

\* Witness Mon, 23 Dec, BBC TWO, 1310-1320 Double bill of the documentary programme. In 'My Friend Evita', Eva Peron's friend and companion for three years recounts life with Argentina's most famous woman. Plus 'In the Shadow of the Moon', in which an eyewitness recalls two total eclipses of the sun visible in the UK during the last century. Regards - Mike

### Book review Cosmic Phenomena

From: KCStarguy@aol.com To: SOLARECLIPSES@AULA.COM Date: Sat, 28 Dec 2002 05:43:33

I had my eye on this book > When my wife did not get the hint and buy it from a camera/telescope store, I bought it at an

## SEScannings

auction put on by my astronomy club. Dr.Eric Flescher (kcstarguy@aol.com) <ericsblacksuneclipse.com> Satori Astronomy website <<http://members.aol.com/kcstarguy/blacksun/satoriastronomy.htm>>

\*\*\*

Cosmic Phenomena by Gabriel Vanin This beautiful book is divided into three sections: Comets, Eclipses and Meteors

This book is filled with beautiful photographs of various eclipses and illustrations as well as having a wealth of great information.

P. 116-118 starts with Eclipses in History Covers beliefs about eclipses from China, South America (Peru, Columbia), India, Indian tribes in North America, Germany, Norway, Alaskan Indians, Tahiti. P.118- Understanding the Phenomena Shows etching on deer bone from France (representing records of lunar eclipse activity) , aerial view of Stonehenge. States the oldest record of an eclipse is Assyrian from June 15, 763 BC (shows a picture of the stone like tablet record) and symbol of Sun on Babylonian tablet from 9th century. Between Two Rivers Covers various accounts by the Babylonians and their prediction methods. Records indicated an eclipse on April 15, 136 BC when Mercury, Venus, Mars and Jupiter were visible during totality. They deciphered the Saros and could indicate "whether a eclipse would occur or not." A mathematical framework would have to wait until Claudius Ptolemy of Egypt. P.120- Shadow of the Celestial Empire An eclipsed moon photo taken during Sept 27, 1996 along with a picture of the Sun Rock from Mexico City , depicting 4 ages of the world represented the sun that surrounds the central figure of the Aztec Sun God. Partial ation about recordings of an eclipse in 120 AD. An account of an annular in 1292 described it as " the sun looked like a ring of gold." p.121- >From the Greeks to the Middle Ages Greeks coined the word eclipse which comes from "ekleipsis" meaning "abandonment: to be flawed ; to become less." Noted a partial eclipse account about the August 2, 1133 . P.122 - lunar eclipse of Feb 9,, 1990 and a picture of the Chinese text which refers to eclipses of 118 and 120 AD. F.Richard Stephenson calculated that at least 1/5 of the historical accounts of eclipses from every part of the world before 1700s are found in the archives of Italian monasteries. First credible account of Italian eclipse from Sicily about the eclipse of August 15, 310 BC which affected the flight of a tyrant Agathocles from Syracuse to avoid a Carthaginian blockade which was followed by the eclipse " a thick darkness fell and stars were seen to shine all over the sky" near dawn. P.123-125 Another eclipse May 5, 840 accounts with illustrations of records of phases of lunar eclipse from around 1568. Eclipse path illustration of 310 BC over Sicily. Arabian eclipses Accuracy in predictions advanced (predicting within 40 minutes) and the possibility of determining differences of longitude between locations on the Earth's surface. This led to Arabian astronomer al-Biruni in Afghanistan around 1000 AD, was able to calculate the difference in longitude between two towns in Iran - 1,300 kilometers apart with an error of .15 degree equal to 13.5 kilometers! Modern uses of eclipse accounts First photograph daguerreotype during eclipse of July 28, 1851 and then a drawing of prominences and chromosphere during eclipse of May 28, 1900 by Lilian Martin-Leake. Theory of sun contraction disputed with eclipse evidence. Rotational speed of Earth corroborated by examining eclipse records. Due to tide the rotational rate increases 45 seconds but with longer intervals increased even more . p. 125- Toward the Modern Era Map of eclipse of 136 AD eclipse through Europe and Asia and a drawing of the eclipse of July '8, 1860 showing naked eye details During July 18, 1860 , viewing from Spain, England's Warren de la Rue and Italy's Angelo Secchi confirmed that the prominences belonged to the Sun ( by taking better pictures). P. 126 The eclipse phenomenon Diagrams , picture of 1991 eclipse, geometry of eclipses lunar eclipse pic of Jan 9 , 1982 and Feb 20, 1989 by author. P. 127- Space Geometry information with facts and information. Saros cycle information and picture of annular of May 30, 1984 . Prominence photo using coronagraph. Chromosphere picture of Nov 3 , 1994 eclipse and another picture from July 31, 1981 eclipse showing coronal polar plumes. P. 132- another July 31, 1981 photo Visibility- where eclipses can be seen P. 133- What shows up in the Dark Beautiful image taken of the Feb 16, 1980 eclipse P. 134 coronal plumes photos P. 135- Beautiful picture of the 11/3/1994 totality over Chilean Andes P. 136- Lunar eclipses- alignment, photos (8/17/1989, 12/9/1992 and 4/4/1996) P.137 photos 10/17/1986 P. 138 photo 2/9/1990 and 10/17/1986 by satellite and one of 9/27/1996. P. 141 Photographing eclipses hints with a chart of lunar eclipse visible from 2001 to 2010 P. 144 Solar eclipses Partial, annular information along with photos of partial 10/12/1996 and annular 5/10/1994 along with chart of partial eclipses through 2005 in North America and annualr pic of 1/5/1992 P.146 annular activity map from the chart from previous page, illustration of shadow bands of eclipse in Sicily during 12/22/1870 and Bailey's beads oic from 1991 talks about the eclipse wind ( a cold wind generated by the temperature drop during the eclipse P. 147 says " the approach of the moon's shadow over the ground starting about 15 seconds before totality (? can be seen before this as in Hungary in 1999 and others) P, 147 Wide angle image of shadow and eclipsed totality laden sun P. 148- The Brightness of the sky talks about the darkness ( light drops by a factor of 500) Says this is the quantity of sunlight that hits the distant planet Uranus" and " a thousand times brighter than the night sky under a full moon and comparing to the light about a half an hour after sunset. References to ancient records about the stars coming out 310 BC . 3rd magnitude stars were seen during some eclipses as recorded 1842, 1860, 1937 and 1940 . Says the illumination of dark eclipses

(Continued on page 11)

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at least a few hundred times (brighter) than the full moon. P. 150- A travel journal authors account of 1991; pictures of 1994 totality; sequential eclipse photos of 10/24/1995 eclipse; P.151- total eclipse pic taken by Apollo astronauts 11/12/1969 P. 154- The eclipse of 1999 with maps (where to observe - okay it is a little late for this) , photos; chart of totals to 2020 P. 158- illustration demonstrates the size of sun taken with different lenses from 200 mm to 2000 mm P. 159 Observing the eclipse Diamond ring pics of 1995 eclipse P. 160-61 pics of 11/3/1994 eclipse A Life-long memory talks about watching and photographing P.162- 1991 pics and how to capture certain events like Bailey's beads etc P. 164 almost same pic of 11/3/1994 eclipse as previous over the Andes P. 165 map of eclipses total to to 2020 This page has a pic of a sheet used to observe and measure shadow bands; briefly mentions how to photograph them and very little about videotaping

ends with " it is absolutely essential to use a filter for the partial phases"

The only thing is this ending. Otherwise the book with the eclipse stuff as well as the beautiful photos and info on meteor and comets makes this a beautiful addition to your eclipse book collection.

From: GJMadden

Friends, FYI: This book is currently available from Amazon.com for US\$8.00.

I ordered a copy: Shipping estimate: December 31, 2002  
Delivery estimate: January 3, 2003 - January 9, 2003

1 "Cosmic Phenomena : Comets, Meteor Showers, Eclipses" Gabriele Vanin; Hardcover; @ \$7.99 each

This is the hardcover edition which was priced at US \$35.00. madden/rochester [eof]

### SENL December Index

From PP

Dear all, Please find herewith the Index of the December 2002 issue of the Solar Eclipse Newsletter (SENL). Beside the topic, the page number is listed. A Special Edition will be published by the end of the week and will cover pictures and reports of the last Total Solar Eclipse of 4 December 2002. Please send your contributions now to us. Thank you.

.../...

See the latest SENL and also the complete SENL Index since November 1996 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/SENInde.htm> with example: SENL0011.pdf

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

Comments and contributions are welcome at [patrick\\_poitevin@hotmail.com](mailto:patrick_poitevin@hotmail.com)

And ... keep those solar eclipse related messages coming ... Best Regards, Patrick and Joanne

[solareclipsewebpages@btopenworld.com](mailto:solareclipsewebpages@btopenworld.com)

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

### SENL Special

From PP:

Dear all, We received a lot of reports of the latest Total Solar Eclipse of 4 December 2002. Thank you all for your contributions. Please have a look in the Special Edition of the Solar Eclipse Newsletter. Due to the size, we had to split in 3 parts. Have a look at:

[http://solareclipsewebpages.users.btopenworld.com/SENL\\_files/Senl200301SpecialA.PDF](http://solareclipsewebpages.users.btopenworld.com/SENL_files/Senl200301SpecialA.PDF)

[http://solareclipsewebpages.users.btopenworld.com/SENL\\_files/Senl200301SpecialB.PDF](http://solareclipsewebpages.users.btopenworld.com/SENL_files/Senl200301SpecialB.PDF)

[http://solareclipsewebpages.users.btopenworld.com/SENL\\_files/Senl200301SpecialC.PDF](http://solareclipsewebpages.users.btopenworld.com/SENL_files/Senl200301SpecialC.PDF)

Your reports and pictures are still welcome and will be posted in the January issue of the Solar Eclipse Newsletter (SENL).



## SEScannings

Links to reports and webpages of this total solar eclipse are at:

[http://solareclipsewebpages.users.btopenworld.com/SECalendar\\_files/20021204.html](http://solareclipsewebpages.users.btopenworld.com/SECalendar_files/20021204.html) for our report

and [http://solareclipsewebpages.users.btopenworld.com/SECalendar\\_files/TSE20021204Links.html](http://solareclipsewebpages.users.btopenworld.com/SECalendar_files/TSE20021204Links.html) for many other links

See as well the latest SENL and also the complete SENL Index since November 1996 at

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

The SENL Special will be soon on the Web-Pages 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

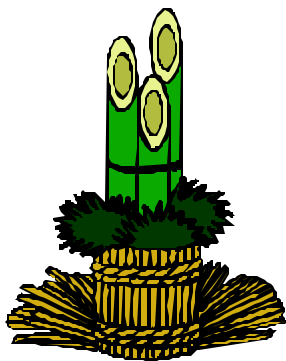
<http://sunearth.gsfc.nasa.gov/eclipse/SENL/SENL0011.pdf>

Comments and contributions are welcome at [patrick\\_poitevin@hotmail.com](mailto:patrick_poitevin@hotmail.com)

Happy New Year, happy reading ... and ... keep those solar eclipse related messages coming ...

Best Regards, Patrick and Joanne

solarclip -



### SENL December 2002 NOW ONLINE!

From: [u32fe@lepvax.gsfc.nasa.gov](mailto:u32fe@lepvax.gsfc.nasa.gov) To: SOLARECLIPSES@AULA.COM Date: Thu, 26 Dec 2002 17:11:26

Joanne Poitevin has prepared a new issue of the SENL (Solar Eclipse Newsletter) for the month of December 2002.

All issues are online in pdf format and can be accessed via the SENL index page of MrEclipse.com:

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

Other recent issues currently linked from the above page include:

SENL - January 2002 - Part A (0.7 MB pdf file\*)  
 SENL - January 2002 - Part B (1.3 MB pdf file\*)  
 SENL - February 2002 (1.2 MB pdf file\*)  
 SENL - March 2002 - Part A (0.7 MB pdf file\*)  
 SENL - March 2002 - Part B (0.8 MB pdf file\*)  
 SENL - April 2002 (1.1 MB pdf file\*)  
 SENL - May 2002 - Part A (1.1 MB pdf file\*)  
 SENL - May 2002 - Part B (0.6 MB pdf file\*)  
 SENL - June 2002 - Part A (0.5 MB pdf file\*)  
 SENL - June 2002 - Part B (0.8 MB pdf file\*)  
 SENL - July 2002 - Part A (0.8 MB pdf file\*)  
 SENL - July 2002 - Part B (1.0 MB pdf file\*)  
 SENL - August 2002 - Part A (1.2 MB pdf file\*)  
 SENL - August 2002 - Part B (1.3 MB pdf file\*)  
 SENL - August 2002 - Part C (0.9 MB pdf file\*)  
 SENL - September 2002 (1.3 MB pdf file\*)  
 SENL - October 2002 - Part A (1.1 MB pdf file\*)  
 SENL - October 2002 - Part B (1.0 MB pdf file\*)  
 SENL - November 2002 (1.1 MB pdf file\*)



SENL - December 2002 (0.9 MB pdf file\*)

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

As always, thanks for the hard work Joanne! Happy New Year! - Fred Espenak

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 Name: Fred Espenak Planetary Systems Branch, Code 693 e-mail: [u32fe@lepvax.gsfc.nasa.gov](mailto:u32fe@lepvax.gsfc.nasa.gov) NASA/Goddard Space Flight Center Voice: 301-286-5333 Greenbelt, MD 20771 FAX: 301-286-0212 USA

Eclipse Home Page - <http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html>  
 Eclipses in 2002 - <http://sunearth.gsfc.nasa.gov/eclipse/OH/OH2002.html>  
 2002 Total Eclipse - <http://sunearth.gsfc.nasa.gov/eclipse/TSE2002/TSE2002.html>



## SETalk

**More movies with eclipses**

From: Joel Moskowitz To: SOLARECLIPSES@AULA.COM  
Date: Thu, 02 Jan 2003 04:06:52

Hi all, A while back there was a thread on movies featuring eclipses. Well, I now have a new one to add to the list. The new movie "The Wild Thornberries" features a TSE in Africa. AND, the night before the eclipse, it actually represents the proper phase of the moon. For those not familiar, this is a children's cartoon movie made out of the popular show from Nickelodeon. It is quite cute and entertaining, especially if you have children. Joel M. Moskowitz, M.D. 8 (total)solar eclipses and counting

From: rlavoie@total.net

I was asked earlier to give the titles of NFB (Canada) movies including some of my footage from different eclipses, but life is such that you don't have always time to answer emails, especially coming back from an eclipse trip! So, here they are:

"Almanach" (1999), dir.: Denys Desjardins, prod.: National Film Board of Canada (French Program). A satirical documentary movie on the end of the millenium. Film footage from the Feb 26, 1998 eclipse, from Guadeloupe. <http://www.nfb.ca/almanach/>

"Hubert Reeves, conteur d'étoiles" (2002), dir.: Iolande Cadrin-Rossignol, prod.: National Film Board of Canada (French Program). A documentary on astrophysicist and educator Hubert Reeves, well known in French speaking countries. Film footage from June 21, 2001 eclipse, from Zambia. I also contributed time lapse film footage (2 shots of starry skies) and telescopic video footage of Jupiter, Saturn and the Moon. <http://www.nfb.ca/hubertreeves/>

Happy New Year to all! Richard D. Lavoie

**Delta T**

From: Jean Meeus Date: Thu, 05 Dec 2002 07:02:23

On 2002 November 1 Delta T, the difference between the uniform Dynamical Time and the Universal Time, was 64.43 seconds.

This is an increase of only 0.18 second since 2001 November 1, so a more rapid grow of Delta T is not yet in sight. Jean Meeus

**Charles the Great and eclipses**

From: Franz Krojer To: HASTRO-L@LISTSERV.WVU.EDU  
Date: Thu, 05 Dec 2002 13:12:17

Hi \*\*\*\*\*, in Einhard's book about Charles the Great, coming to his death (AD 814), Einhard speaks about many signs before his death, which are sometimes phantastic. Einhard says also that very much solar and lunar eclipses were seen before his death. My question is, if there were indeed at random much more eclipses visible in Europe some years before and until 814? Thanks Franz Krojer

From: Gent van R.H.

Hi Franz,, For your question, perhaps the best solution is to look at the maps of solar eclipse paths published in:

J.Fr. Schroeter, \_Spezieller Kanon der Zentralen Sonnen- und Mondfinsternisse, welche innerhalb des Zeitraums von 600 bis 1800 n.Chr. in Europa sichtbar waren\_ (Jacob Dybwad, Kristiania, 1923).

More reliable maps of solar eclipse paths are available in Fred Espenak's "World Atlas of Solar Eclipse Paths" at

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

but these do not (yet) reach further back as AD 1001. Best wishes,

From: Michael L. Gorodetsky

Before the death of Charles the Great solar eclipses were indeed quite frequent - large eclipses in 807, 810 and 813 and with the phases of more than 0.5 in 809, 812 and 814 (near every year). Below is the table for the local circumstances of eclipses with the phase more than 0.5 in Aachen from 700 to 900AD.

LOCAL CIRCUMSTANCES OF SOLAR ECLIPSES for latitude 50.77 N, longitude 6.10 E. All eclipses with phase  $\geq 0.500$ .

===Date===	Dw	TM,UT	MeeusN	ET	-UT	Phase	Sun_	%
704/03/10	Mo	16:30	-14790	50.1	0.686	60.6		
706/07/14	We	17:59	-14761	49.9	0.734	66.2		
709/05/14	Tu	05:08	-14726	49.6	0.661	58.0		
713/03/01	We	14:35	-14679	49.2	0.711	64.1		
718/06/03	Fr	15:05	-14614	48.6	0.643	56.2		
720/10/06	Su	16:11	-14585	48.4	0.826	78.7		
730/10/16	Mo	15:45	-14461	47.3	0.549	44.5		
733/08/14	Fr	08:57	-14426	47.0	0.955	93.2		

(Continued on page 14)

## SETalk

737/06/03 Mo 06:35 -14379 46.6 0.576 47.4  
 753/01/09 Tu 11:43 -14186 45.0 0.890 81.6  
 758/04/12 We 15:18 -14121 44.5 0.981 98.1  
 759/04/02 Mo 05:05 -14109 44.4 0.586 49.5  
 760/08/15 Fr 15:15 -14092 44.2 0.802 74.8  
 764/06/04 Mo 11:15 -14045 43.9 0.885 84.4  
 779/08/16 Mo 10:21 -13857 42.4 0.520 42.0  
 782/06/15 Sa 18:55 -13822 42.1 0.571 46.4  
 787/09/16 Su 06:59 -13757 41.6 0.696 61.3  
 807/02/11 Th 11:06 -13517 39.7 0.826 75.2  
 809/07/16 Mo 09:53 -13487 39.5 0.660 56.9  
 810/11/30 Sa 10:40 -13470 39.3 0.919 90.1  
 812/05/14 Fr 12:51 -13452 39.2 0.570 47.6  
 813/05/04 We 03:58 -13440 39.1 0.868 84.7  
 814/09/17 Su 13:52 -13423 39.0 0.604 50.8  
 818/07/07 We 05:33 -13376 38.6 0.582 47.6  
 820/12/09 Su 09:10 -13346 38.4 0.568 46.3  
 824/09/26 Mo 11:33 -13299 38.0 0.571 47.5  
 827/07/27 Sa 18:17 -13264 37.8 0.530 41.8  
 833/09/17 We 10:10 -13188 37.2 0.596 50.6  
 835/03/03 We 06:34 -13170 37.1 0.628 52.6  
 836/07/17 Mo 14:17 -13153 36.9 0.597 49.4  
 840/05/05 We 12:45 -13106 36.6 0.901 89.1  
 852/03/24 Th 15:29 -12959 35.5 0.924 86.1  
 861/03/15 Sa 08:32 -12848 34.7 0.606 49.9  
 863/08/18 We 05:43 -12818 34.5 0.799 73.0  
 865/01/01 Mo 14:23 -12801 34.4 0.883 85.4  
 868/10/19 Tu 14:24 -12754 34.0 0.683 60.2  
 875/01/11 Tu 11:45 -12677 33.5 0.547 43.9  
 878/10/29 We 13:36 -12630 33.1 1.025 100.0  
 885/06/16 We 09:56 -12548 32.6 0.784 74.3  
 891/08/08 Su 09:08 -12472 32.0 0.868 81.2  
 894/06/07 Fr 10:26 -12437 31.8 0.659 58.7

>From 800 to 815 the following total lunar eclipses visible in Europe happened:

810/06/20 Th 19:50.4

810/12/14 Sa 18:09.6

814/10/03 Tu 03:34.3

Michael L. Gorodetsky

From: Axel Harvey

Although I don't think maps are available (I use my text-only browser for these tables) 9th-century solar and lunar eclipses are catalogued in Fred Espenak's website, which covers a few millennia:

<http://sunearth.gsfc.nasa.gov/eclipse/SEcat/SE0801-0900.html>

<http://sunearth.gsfc.nasa.gov/eclipse/LEcat/LE0801-0900.html>

For the solar eclipses, the table states the latitude and longitude of places where each eclipse maximum was seen. This can give a general idea of where the eclipse might be observed.

For the lunar eclipses, we can assume that if the hour of the eclipse maximum (given in Universal Time) falls in the middle of the night in Europe, then it would be visible there weather permitting.

From: Franz Krojer

Thanks Robert and Michael! Just for completeness, her the full text of Einhard: <http://www.fordham.edu/halsall/basis/einhard.html>

Chapter 32 is with the "omens": sun-spots, a fire-ball and eclipses etc. Bye Franz Krojer

From: Michael L. Gorodetsky

>From the point of view of the history of astronomy much more interesting is the anonymous biography of emperor Louis - the son of Charles the Great. Astronomical descriptions are frequent here and because the author says that he was considered as knowledgeable in celestial events, in historiography he is simply called "Astronomer". Contrary to Einhard precise dates and even time of solar and lunar eclipses are usually given. Unfortunately I have only russian translation of this text.

From: ECOLING@AOL.COM

One can also check this kind of thing for comets, for any time period for which Eurasian civilizations have records, using Gary Kronk's \*Cometography\*

As one example, of all of the recorded passages of Haley's comet, the one in 837 CE must have been the most spectacular, noted as reaching 80 degrees length across the sky at its maximum, and approaching closer to the earth, 13 times the distance to the moon. Was that one recorded by Charlemagne's son?

Kronk (p.126) writes: "This comet was also extensively observed in Germany. The \*Vita Hludowici Imperatoris\* (840) mentions a comet seen in this year "in the middle of the Easter 'festivity' in Virgo, and was seen for 25 das, crossing Leo, Cancer, and Gemini." Easter was on 837 April 1st. Interestingly, the comet's observed path never took it to Cancer and Gemini. Meanwhile, the \*Annales Xantenses\* (873) simply mentions that a comet was seen, while the \*Annales Fuldenses\* (901) notes "A comet ap-

(Continued on page 15)

## SETalk

peared in Libra on April 11, and was visible for three nights." Kronk p.125 notes the closest approach was on April 10th.

Studies of how often, and in which ways, cultures have referred to events in the sky or do not, should permit better interpretations of additional more obscure references. One of the responses to this, pointing to the son of Charles the Great, may indicate one reaction to unusual events: spending more time recording and looking at the sky.

We have that problem in interpreting some obscure mentions from the high Andes mountains of South America, the chronicle II of Montesinos, which is mixed with much fanciful material about origins in Ophir, stylish for the time period (1600's), but which may also contain real history. How do we evaluate such materials? Surely by trying to figure out how people \*do\* react to the sky, in those cultures and in others.

Having some objective graphs and tables indicating when particularly unusual and highly visible events have occurred, which of them were more salient visually as compared with others, is one of the tools. How the memories of such events are attenuated over time or across other dimensions can also be studied. Clusters of such events should be especially noted. Anyone looking for PhD dissertation topics? Lloyd Anderson Ecological Linguistics

From: Franz Krojer

When looking for synchronizations between European sources with other cultures, the comet of 837 was firstly my best "candidate", because it seemed to be a very good agreement. But when analyzing the text of the Vita Hludowici Imperatoris more detailed, Thomas Schmidt and I found a lot of discrepancies between the modern calculations of Halley's comet together with the Chinese observations against the Vita Hludowici Imperatoris. Therefore I contacted Gary W. Kronk, and here is his answer from May 16 2001:

The Vita Hludowici Imperatoris is a text I could never figure out when it came to the 837 apparition of Halley's Comet. Updates ended in 840, so one would assume the writer was a contemporary of the appearance of the 837 comet, but if that was so, then why does the writer get so much wrong about this comet?

The orbit of the comet is very well known and the details are fully confirmed by the extensive Chinese accounts. At first glance I was impressed with the details given in the Vita Hludowici Imperatoris. It was seen around Easter and remained visible for 25 days. That actually fits fairly well with the Chinese observations, which indicate the comet was seen until April 28. Since Easter was on April 1, 25 days of visibility is a good estimate. But the comet was said to have been discovered in Virgo, where in reality it was near the Aquarius-Capricornus border and about to move into the latter constellation. The comet's tail would not have begun pointing toward Virgo until the night of April 10/11, when the comet would have been just just over 20 degrees south of Virgo, and the tail would have continued pointing toward Virgo for several days thereafter. Interestingly, the tail was probably easily extending into Virgo from April 11 until around the 18th. In order for the Vita Hludowici Imperatoris to properly report the comet being discovered in Virgo would require the observation to have occurred about 10 days later and this would put the final observation (25 days later) on May 6, or over a week after the final Chinese observation. I would like to note here that the Chinese not only indicate a total visibility of 39 days, but the Muslims indicate 40 days, so there is good, independent evidence that the comet was not seen into May.

The account goes on to say the comet was in Leo, Cancer, and Gemini. Although the comet never entered these three constellations, the tail did enter Leo on April 16, at which time the comet was in Sextans. Now the comet had just passed very near Earth on April 10, and by the 16th it had slowed in its movement across the sky to the point that it virtually stopped in Sextans until early June, at which time it would have slowly drifted backwards into Leo. Now your suggestion that the tail might have been very long in order to reach Cancer and Gemini is a good suggestion. The Chinese reported the tail reached 80 degrees long on April 13, while the Japanese noted an "extremely long" tail was seen during this apparition and the Muslims described it as "very long." But here is the important part. While the tail was at its greatest length, the comet was about 30 degrees from Cancer and the tail was extending in the direction opposite to that of Cancer. So the reference to Cancer and Gemini appear to have been totally misplaced with respect to this comet. Gary

The best "candidate" from this time I found, is the comet from 817 AD: it was visible in Europe together with a lunar eclipse and shortly after it in China. (see Kronk's Cometography). Bye Franz Krojer

## SETalk

### South magnetic point

From: klipsi@bluewin.ch To: SOLARECLIPSES@AULA.COM Date: Thu, 12 Dec 2002 02:28:56

I have an off-topic question, which might still be of interest for most of us, as it may be important for use of GPS and compass in Antarctica next year.

When reading a map of Antarctica, I found a point named "south magnetic point" and another point named "south geomagnetic point".

Can someone explain to me the difference, or the reason why there are two different points ?

on my map, the south magnetic point, offcoast, at sea near french Dumon d'Urville station, is where compass needles point towards.

on same map, the south geomagnetic point, way inland and near the russian Soyuz station, " ... marks the axis of Earth's magnetic field ".

so why does a compass point to a different location than the axis of the magnetic field ?? Klipsi

From: Evan Zucker

Magnetic North Pole Located more than 1000 miles south of the geographic North Pole lies the Earth's Magnetic North Pole at 78°18' North and 104° West, near Canada's Ellef Ringness Island. The Magnetic Pole is the northern focus of the planet's magnetic field and is the point that traditional magnetic compasses point toward. First discovered by John Ross in 1831, who determined its location on Boothia Peninsula near Cape Adelaide, the Magnetic North Pole has migrated hundreds of miles from its present location.

The Geomagnetic North Pole Located north of Qaanaaq (Thule) in Greenland, the Geomagnetic North Pole is the north end of the axis of the magnetosphere, the geomagnetic field that surrounds earth. Currently at latitude 78°30' North, 69° West the Geomagnetic Pole is significant to atmospheric scientists who study the effects of the Aurora Borealis or Northern Lights. Auroral displays most commonly occur in a stratospheric torus or doughnut-shaped surface within 23° of the Geomagnetic Pole. <http://www.arcticconnection.com/northpole/index.shtml> -- EVAN

### Online eclipse calculations

From: F.Podmore To: Solar Eclipses Mailing List <solareclipses@aula.com> Date: Wed, 18 Dec 2002

Can someone please give me (again!) the websites where I can do online eclipse predictions? I want to look ahead to see the degree of partiality in Harare for forthcoming eclipses.

[sorry, Michael (Gill), I know you sent me this before but I'm damned if I can find your email...

And someone here has found a splendid online eclipse circumstances calculator "on a NASA website" - but he's gone on holiday so I cannot ask him what it is - does anyone know? Called 'gen' or something like that.

[Fred: I didn't see it on your sunearth....eclipse/eclipse.html website - have I missed it there?] Many thanks, Francis



## SETalk

**How Galileo observed the sun?**

From: Trudy Bell To: HASTRO-L@LISTSERV.WVU.EDU Date: Thu, 05 Dec 2002 16:25:44

Folks - For a children's book I am writing on the Sun, the editor has queried how Galileo could have observed sunspots through his telescope without frying his retina. Did he use a filter? eyepiece projection? did he just observe through thick clouds? or were his optics so long-focus, small-aperture, and thick that he had semi-adequate filtering? Is there any clue in his writings about the Sun? Much obliged for any help - and many thanks! - Trudy E. Bell

From: Barbara Becker

He used a projection system which he describes in his letters on sunspots -- see Stillman Drake's Discoveries and Opinions of Galileo. best, Barb.

From: giancarlo.truffa@ST.COM

You can try these pages:

<http://es.rice.edu/ES/humsoc/Galileo/Things/sunspots.html>

<http://www.exploratorium.edu/sunspots/history.html>

Best regards Giancarlo Truffa Milan - Italy

From: Storm Dunlop

Although to the best of my knowledge, there is no exact description of Galileo's method of observing the Sun, Scheiner - with whom Galileo had the famous argument about priority of observing sunspots - used projection, as seen in the well-known frontispiece to 'Rosa Ursina'.

Galileo probably did precisely the same. There is an important point here, it is wrongly thought that you cannot project an image of the Sun with a 'Galilean' telescope, which had an internal focus and an upright image.

Some years ago, when translating a book by Prof. Kippenhahn, I came across just that statement that he (Rudolf) had made, which I immediately queried with him. He was certain that you could NOT use a Galilean telescope, and I was certain you could. So I found a pair of opera glasses, which are Galilean tried them, and obtained a perfectly adequate image. I then contacted Steve Ringwood, who has made (among other items) replicas of Galileo's telescopes, with identical OGs and eyepieces. He didn't believe you could get an image, but when he tried it - yes, you could.

Galileo surely had enough sense to know that you are blinded (metaphorically, if not literally) if you stare at the Sun long enough even without a telescope. If Scheiner used projection, and projection is possible with Galileo's telescopes, I would imagine he did just the same. Storm Dunlop

From: Peter Abrahams

A question was asked, concerning how Galileo observed the sun. Stillman Drake, in the translations comprising 'Discoveries and Opinions of Galileo' Garden City: Doubleday, 1957, included 'Letters on Sunspots', where on p115 (paperback edition) is found: "....the method of drawing the spots....was discovered....by Benedetto Castelli....Direct the telescope upon the sun....expose a flat white sheet of paper about a foot from the concave lens; upon this will fall a circular image of the sun's disk....The more the paper is moved away from the tube, the larger this image will become, and the better the spots will be depicted. Thus they will all be seen without damage to the eye, even the smallest of them -- which, when observed through the telescope, can scarcely be perceived, and only with fatigue and injury to the eyes....But one must work dextrously, following the movement of the sun and frequently moving the telescope, which must be kept directly on the sun. The correct position may be recognized by looking in the convex lens, where one may see a little luminous circle that is concentric with this lens when the tube is properly pointed toward the sun.....Next one must note that the spots come from the telescope inverted, and reversed from their positions on the sun; that is, from left to right and from top to bottom; for the rays intersect one another inside the tube before coming through the concave lens."

This passage is of interest for several reasons. First, Galileo has apparently viewed the sun directly through the telescope or heard of such experiences. I'd guess that he had personally taken a glance, or more. This could possibly have been done without injury if at dawn or dusk, through clouds, or using a colored glass or a very small aperture stop. Or, he could have injured his eyes.

Second, the note that the image is inverted and reversed is very puzzling, since this is not the orientation of an image from a Galilean telescope. The following section describes how the drawing is done on the side of the paper that is facing the sun, and has to be inverted and then viewed as a transparency, to achieve the same orientation as the actual view. This section at least partially explains the notion. The image is reversed, in these terms; since if you make a drawing of an image projected on a paper, and then hold the drawing up to the view of the object, it will be reversed --

(Continued on page 18)

## SETalk

*(Continued from page 17)*

even though a Galilean image is actually correctly oriented. The terms used are 'upside down', 'reversal', 'inverted', 'top to bottom', and 'opposite to our sight'. The concepts are: paper rotated like a clock face to invert it; paper viewed as a transparency to invert it; image reversed left to right; image inverted top to bottom. Translation is hazardous with these concepts. But it doesn't make sense that the image is inverted and reversed.

More clearly, it is not accurate that the 'rays intersect inside the tube', and a Galilean eyepiece will not function in this manner. Whether this is an error in Galileo's conception or his narration; or from an erroneous later transcription or publication, or in the modern translation, (or in my understanding), is hard to say. --Peter

From: Steve McCluskey

At 11:46 PM 12/6/2002 -0800, you wrote: A question was asked, concerning how Galileo observed the sun. Stillman Drake, in the translations comprising 'Discoveries and Opinions of Galileo' Garden City: Doubleday, 1957, included 'Letters on Sunspots', where on p115 (paperback edition) is found: "..... .."

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>

>More clearly, it is not accurate that the 'rays intersect inside the tube', and a Galilean eyepiece will not function in this manner. Whether this is an error in Galileo's conception or his narration; or from an erroneous later transcription or publication, or in the modern translation, (or in my understanding), is hard to say. Galileo did not have a fully developed theory of the telescope (various theories were developed later in the century by Kepler, Descartes, and others). Galileo's description probably comes from the long tradition of observing the Sun using a pinhole image or camera obscura. In medieval analyses of pinhole images, it was recognized that rays from the various parts of the Sun intersected at or near the aperture. Galileo seems to be extending this concept of intersecting rays to the telescope. Steve McCluskey

From: Paolo Amoroso

Or he might have compared the image of a bright but not blinding object, such as the Moon or a distant candle, as projected by the telescope and seen with the naked eye[\*]. Paolo

From: James Caplan

Yes it does. An inverting telescope such as Kepler's projects a non-inverted image, and a non-inverting telescope such as Galileo's projects an inverted image. Try it.

Think of it this way: If you look at an object in a non-inverting telescope, you must look down to see the bottom of the object and look up to see the top. Which shows that the light coming from the TOP is directed DOWNWARDS; if this light is focused on a screen it will therefore be on the bottom.

Or this way: In an inverting ("astronomical") refractor, the objective lens forms a primary image which is upside down, just like at the focus of a camera. The positive eyepiece acts like a loupe (magnifying glass) to look at this primary image from close up, and you see it upside down. But if you use the eyepiece to project this primary image on a screen then another reversal takes place, and the final image is right-side up.

Galileo's statement that "the rays intersect one another inside the tube before coming through the concave [i.e. eyepiece] lens" does seem incorrect. In a Galilean telescope the rays intersect only at the objective lens. In a Keplerian telescope there is a second intersection at the exit pupil. Jim Caplan

### Eclipse correlation

From: Discipletrade@aol.com Date: Thu, 12 Dec 2002 12:54:57 EST To: eclipse@hydra.carleton.ca

This is extremely interesting info...I am trying to correlate scriptures, such as Job 9:9 Job 38: 31,32 Isaiah 47:13 and Daniel 1:20 2:2 2:10, with specific information in reference to eclipses, astroidal occurrences and changes in the PLEIADES! Thankx for the eclipse info. and please stay in touch discipletrade Carol



## SETalk

**GPS handheld receivers--off topic**

From: Dribalz@aol.com To: SOLARECLIPSES@AULA.COM Date: Wed, 11 Dec 2002 13:30:56

This is slightly off topic so I'd appreciate all replies emailed to me privately at dribalz@aol.com

Has anyone had success using their GPS receivers inside of commercial jet aircraft? I am taking a trip to Puerto Rico in a few days and I am going to take my Magellan 315. I have a window seat and wanted to track the flight for at least part of the trip. Will the receiver work well if I place it up against the window? Has anyone had any success doing this type of tracking?

BTW Thanks to all who posted on the recent eclipse. The photos and videos were great. Wish I could have been there. Andrew Hans

From: Sheridan Williams

I have used my GPS many times in commercial aircraft. It does need to be held close to the window though. It is great fun used on take off or landing to see the speed. Also during flight the speed and altitude are also shown of course.

If you have mapping data on the GPS you can identify rivers, coastlines, towns etc. Best wishes Sheridan Williams

From: Dale Ireland

Hi I used my GPS a number of times on the trip across the Pacific. I enjoyed watching it cross the equator and the 180 line. Qantas and Air Tahiti Nui only asked for electronic devices to be turned off during landing. Alaska specifically demanded that GPS's never be used during the entire flight. To use a GPS on a plane you must have a window seat and you must hold the GPS right against the window for a number of minutes. There must be a few satellites on that side of the plane. It worked about 75% of the times I tried. If you fly thousands of miles before turning it on it will take forever (10 minutes or more) to re-orient itself. With the Garmin you sometimes must select "new Location" for it to find its new position more quickly. Our GPS came in very handy during the drive to the eclipse site as it was very remote and featureless. I would like to hear from anyone else who was on the Arkaroola busses to compare my reading from the site. Dale

From: Sheridan Williams

I use my GPS regularly. I always considered it a "passive" device which could not interfere with anything on the air-

craft. Am I wrong? Best wishes Sheridan Williams

From: Evan Zucker

Any electronic device emits a certain amount of electromagnetic radiation. In theory, it's possible for such radiation to interfere with aircraft systems. I always thought that such concerns were way overblown. After all, the hijacked airliners on September 11 were full of people making cellular phone calls, and those planes didn't have any problem finding their target. However, airlines obviously want to err on the side of caution when it comes to passenger safety. Evan H. Zucker San Diego, California

From: Donald Watrous

See <http://www.gpsinformation.net/airgps/gpsrft.htm> which has a good discussion of the subject and a link (at the bottom of the page) to a list of airlines which allow or disallow GPS usage. Don

From: Dale Ireland

Hi A GPS unit is not passive, it has an oscillator and other electronics that match frequencies and emit at those frequencies. The emissions are tiny and I am sure you would have to have many running to make any effect on the plane's navigation. However, it is still against airline policy to use them. Almost every airline specifically mentions them in the back of the in-flight magazine you have at your seat and some specifically mention them in the audio instructions i.e. Alaska Airlines. You can also check most airline web sites and see that they are banned (but not in practice) Dale P.S. I think the 9/11 hijackers used just the compass and visual landmarks, they were not too sophisticated, that's why they chose certain weather and time of day

From: Robert B Slobins

Evan: Those planes were flying in severe clear skies. A pair of eyes was all that was necessary to navigate.

What frequencies do GPS receivers use and are they harmonics of the VHF frequencies used in air navigation.

To get back to subject: One can make valuable aurora observations on long-distance flights near or under the auroral oval at night. A GPS would be essential to this work. cheers/rbs



## SETalk

**Partial Eclipse, July 01, 2011**

From: Geoff To: SOLARECLIPSES@AULA.COM  
Date: Tue, 17 Dec 2002 21:49:31

Hi, When I was browsing through future eclipses, as you do, I stumbled across a rather interesting one, or so I thought, and was wondering if anyone has considered this one. I think it is interesting also as we have been discussing about whether it is worth travelling to total lunar eclipses.

The Partial Solar Eclipses of July 01, 2011 - a very tiny partial, only magnitude 0.096. The reason I found it interesting was the fact that the area of visibility is TINY. Furthermore, it lies in one of the most hard to reach places on Earth, Antarctica. It doesn't even touch land (as far as I can see). Now, of course we will [at least try] to travel to Annular/Total solar eclipses in Antarctica (and other remote places too). However, would anyone invest the time or money or charter a boat to go to the remote corner of the Earth, to witness a tiny partial eclipse?

My guess would be NO - just by looking at the cost factors involved with expeditions to Antarctica, it sounds ridiculous. As stated before, it is definately worth it for a Total eclipse, and possible worth it for an annular. And now with all this in mind.. this could be a Solar Eclipse that occurs without a single Human to witness it.

Now, would the opportunity to be the only person on the planet to witness a Solar Eclipse be more of a reason to invest the time to travel to this? --Geoff

From: Evan Zucker

Not a chance. As you may know, there are many small magnitude partial eclipses that are only visible in the polar regions. I'm sure nearly all of these have long gone unobserved by anybody and will continue to go unobserved.

If you want to make a name for yourself, then be the only person (or only expedition) to observe a total or annular eclipse, as Glenn Schneider and his small group did in 1986. -- EVAN

From: Geoff

There is the other added novelty that this eclipse occurs on Independence Day (relevant for Americans)...

From: Jay.M.Pasachoff@williams.edu

Well, it's my birthday.... Jay Pasachoff

From: Robert B Slobins

Geoff: Independence Day is 4 July (1776). Canada's 'birthday' is 1 July (1867). It depends on what you mean by "Americans". ;-) cheers/rbs

**"Uniqueness" was Re: [SE] Partial Eclipse, July 01, 2011**

From: Glenn Schneider To: SOLARECLIPSES@AULA.COM Date: Wed, 18 Dec 2002 17:12:46

> If you want to make a name for yourself, then be the only person (or only expedition) to observe a total or annular eclipse, as Glenn Schneider and his small group did in 1986.

I've been called lots of names in the past - some not reproducible on even a by-subscription email exploder. I still remember some of them uttered in reaction to the crazy idea of the 1986 eclipse flight. Still, I hate to think that will be the apex of my epitaph after my eventual passing to the land of un-ending eclipses, and was sort of hoping I might be remembered for HR 4796A or other stuff I do for "real". However, as Bob Morris has said before in different words - you really have not completed your resume of eclipse viewing until you see an eclipse with a topographic gamma of (or VERY close to) 1.000. There is an opportunity in 2005 at one of the annular/total transition points. Obviously by ship. I suspect a cruise to a 0s eclipse might be shunned by some and most would opt for the 42s of totality at maximum - but it is a distinct possibility which I strongly suggest be considered.

Sheridan: For eclipses like that (and 1966 and 1986) I am glad you do your bookkeeping by number rather than duration! Glenn Schneider

From: Robert B Slobins

I would sail that ship to a point for 20-30 second duration. Just how accurate are the predictions? Zero seconds \*may\* involve a few Baily's Beads visible at all times. My record of the 21 June 2001 total eclipse indicates a totality that was 6 seconds late at second contact and 1 second late at third. Keep that in mind. Do we have accurate timings from this past one yet? Also, the 13 November 2013 total solar eclipse will produce a 16 second totality in East Africa. This will occur at solar maximum. I would expect the weather at that part of the world to be good. The word that comes to mind for this one is 'yummy'. It will be worth living another 11 years for that. cheers/rbs

From: Crocker, Tony (FSA)

Glenn's 1986 pics show a red chromosphere ring with some Baily's beads visible at all times. One possible objective for 2005 could be to get a continuous red chromosphere ring without beads. I'll defer to Fred to calculate with limb profile whether that is possible.



## SETalk

**Average TSE success rate is 87%**

From: Sheridan Williams To: SOLARECLIPSES@AULA.COM Date: Sat, 14 Dec 2002 16:54:06

David Makepeace asks what is the clouded-out average for total eclipse chasers?

Using the "League Table of Eclipse Chasers" on my web site ([www.clock-tower.com/tse.htm](http://www.clock-tower.com/tse.htm)) and going back to the original spreadsheet I calculate that of the 588 total solar eclipses visited by the 98 people in the table, 514 were successful. This gives an 87% success rate.

Glenn Schneider has achieved EXACTLY 87% (23 out of 26)

Jay Pasachoff 96% (22 out of 23)

Bill Kramer 100% (16 out of 16)

William Livingstone 100% (16 out of 16)

Bernie Verreau 100% (14 out of 14).

I have not got Bernie and William's results from 2002 yet though.

At the other end of the scale, poor Pierre Arpin has 64% (7 out of 11) and no results yet from 2002.

Please send me your 2002 results on [chasers@clock-tower.com](mailto:chasers@clock-tower.com) Best wishes Sheridan Williams

From: Mike Simmons

I once met someone who claimed to have been clouded out at 9 out of 9 total solar eclipses. I think I was too flabbergasted to ask for details and too dismayed to request collaborative evidence.

What constitutes "clouded out"? I've had thin clouds in front of the Sun during totality twice but could see the corona both times. The conditions weren't optimal for photography of the corona, of course, but I don't consider either a failure. One had thin, high cirrus that were pretty transparent (bright planets shone through) and the other was the edge altocumulus that would have obliterated the view had it been squarely over the Sun. Mike Simmons

From: Joel Moskowitz

Craig Small is 100% for either 21 or 22 totals! Joel M. Moskowitz, M.D. 8 (total)solar eclipses and counting

From: Sheridan Williams

Oops, sorry, I got Glenn's figures wrong.

Glenn has seen 20 out of 23 (87%) actually witnessing 62.4 minutes of totality Jay Pasachoff has seen 22 out of 23 (96%) actually witnessing 54.9 minutes of totality Sheridan Williams

From: Glenn Schneider

To set the record straight I'm only 20/23 - not up to 26 yet. I'll have to wait for 2006 for that statistic. But it is (for me) 87.0% - Guess that puts me right on the average. But that is by number, by time it is 93.4%. What are your statistics on that? Does your list tabulate the duration of totality at the site OR how long totality was SEEN (i.e., less than the duration if cloudy for part of the time)? By the way Craig Small, I believe is 20/20 - or maybe 21/21. I'm sorry I don't have his number - I know he missed either 2 or 3 in the early 1980s, but he has NEVER been clouded out of those he did travel to. What a lucky guy!

Also, as of 1999 I believe Daryl Nye had 26 - I don't know what he did last year or this - but to my knowledge he should be on the top of your list - not me - but I know you want first-hand reporting. Cheers, -GS-

From: Fraser Farrell

I have to admire this unfortunate person's persistence. Even though I would like to know who he/she is, so that I can avoid wherever they are for any future eclipses! ;-) cheers,

From: Sheridan Williams

Glenn is correct he has seen 20 out of 23. My table counts success as (number seen)/(number visited). I agree that it could be done by duration.

I was once berated for including someone in the list without their permission. I was told it was an invasion of their privacy. As a result I do not include anyone who has not contacted me personally. For that reason I cannot include Daryl Nye, or Craig Small, much as I'd like to. Could anyone persuade them? Best wishes Sheridan Williams

From: barr derryll

I briefly visited with Darold and Denise Nye in Port Augusta on the 5th of December. They had observed from Ceduna. Recalling the discussion on the List several months ago regarding persons with most observations, I asked Darold how many eclipses had he ob-

## SETalk

served. He informed me that the Australian eclipse had been his 27th. Sorry, but I did not think to ask if that was totals only or annulars as well. I do have his mailing, sorry not email, address, and will write to him regarding his time in totality and possible interest in posting it on Sheridan's website

### Eclipse durations help

From: Dale Ireland To: Solar Eclipse List  
<SOLARECLIPSES@AULA.COM> Date: Sat, 14 Dec

Hello I have not kept track of the exact durations of some of the total eclipses we have observed. I am sure some of you could help me fill in the blanks. Does anyone know the durations of totality at these popular locations, I am sure many of you were at these spots

Goldendale Observatory 26 Feb 1979

the beach at San Jose del Cabo July 1991

The two trains south of Sevaruyo. Bolivia 1994

The cruise ship Fascination 1998

I can look up the others I have seen in Fred's bulletins Dale

From: Sheridan Williams

San Jose del Cabo.....

I was north of that, right on the centerline, and remember 6m48sec.... That location should have been about 6m 20sec, if I recall.

I will look in the eclipse bible tonight if no one does before that. Rick Brown

From: Robert B Slobins

There is a program called emapwin that plots eclipse paths and local circumstances. You can get theoretical durations from that source. There are also the eclipse circulars with calculated durations in table form for selected locations.

Of course, as I learned in 2001, there is a discrepancy between observed and theoretical. So unless one is timing contacts at that location, (Who really does that as a primary activity?) I guess that we need to use theoretical values.

Also, why is there the emphasis on quantity of totality? I'd rather concentrate on what was accomplished in that time. cheers/rbs

From: Dale Ireland

Hello and thanks all. I have occult, didn't know it had that function. I will give it a try. I can find the lat/long for all the spots except the cruise ship. All those spots were very "popular" just thought some people who were there may have kept the exact duration info for those locales. Just looking for the lazy way out.:) Dale

From: Vic & Jen Winter - ICSTARS Astronomy

Dr. Dale, Would you (and any other SE members) mind communicating your observations and timings with IOTA (International Occultation Timing Association) and Dr. Dunham? He's not a member of the SE group (to my knowledge) and had sent a request for eclipse timings just such as what you indicate you have.

Dr. Dunham is specifically interested in edge observations, but I feel secure that any timing of this accuracy will be of interest.

His email address is: David Dunham <dunham@erols.com> Clear Skies, Jen Winter

From: Dale Ireland

Robert I had WWV in the background of my tape and it seems that the eclipse contacts and duration were right on the predicted times, within a second, just from watching the tape at normal speed. 29d 36m S 139d 47m E I notice the Baileys Bead phase seems unusually short since I had never seen an eclipse near the horizon where the Moon's motion across the Sun is up to 50% faster than when the Moon is near the meridian. Dale

### Eclipse calendar

From: Hamlet0206@aol.com To: solareclipsewebpages@btopenworld.com Date: Tue, 12 Nov 2002

Is there a website containing dates of total solar eclipses in N. America for the 19th century? My mother remembers her grandmother (1846-1929) saying that she lived in Miami Co., Indiana (n. of Indianapolis) during an eclipse. I'm guessing it would have been between 1864 and 1874. Any help would be appreciated. Thanks, John Richardson



## SETalk

**Similar eclipse paths on earth (Look how close 2030 is to 2002)**

From: Jörg Schoppmeyer To: SOLARECLIPSES@AULA.COM Date: Thu, 19 Dec 2002 08:10:40

Hi, long time ago I received the Book "Mucke H. and Meeus J., Canon of Solar Eclipses -2003 to +2526". Inside are very small but nice pictures of solar eclipse paths on earth. When you look more exact on the paths you find the following : there are some eclipses which have a similar path on earth and the time range between this eclipses is always the same (28 years minus 10 days or 9 days) or (9 years minus 10 Days or 9 Days). But I don't know if there is any relation, e. g. a cycle like Saros or Meton ? Maybe Jean can help ?

09.07.1945 and 30.06.1954 09 years minus 10 Days total eclipses

21.08.2017 and 12.08.2026 09 years minus 09 Days total eclipses

11.08.1999 and 02.08.2027 28 years minus 09 Days total eclipses

04.12.2002 and 25.11.2030 28 years minus 10 Days total eclipses

another on is : 26.02.1998 and 17.02.2026 28 Years minus 9 days

but here the first is a total, the second an annular eclipse and the paths are not very similar at all.

It should be easy to find more of this by writing a small program. Joerg

From: Jean Meeus

Certainly it would be interesting to look a little closer to the subject of similar eclipse paths. Perhaps a better name would be "parallel" eclipse paths. Here are just some remarks, and here I want to consider only the period of 9 years minus 9 days. This period corresponds to 111 lunations, and to 120.5 draconic revolutions of the Moon. The fraction 0.5 results in a change of node from one eclipse to the other.

The case of the total eclipses of 1945 July 9 and 1954 June 30 is well-known. The path of totality of the eclipse of 1945 crossed northern Scandinavia. In Brussels the magnitude of the partial eclipse was 0.61. I was a schoolboy of age 16 then, and I did not receive permission from the school director to remain home to see the partial eclipse. The man thought that the lesson of Latin (or was it Greek?) that I would have missed was more important to me than the eclipse. I could see the eclipse from school (after first contact) and on the way to home. The path of totality of 1954

crossed southern Scandinavia. I was in southern Sweden with a Dutch expedition. Unfortunately, the sky was completely overcast. We could only shortly see the partial phases through small breaks in the clouds.

The period of 111 lunations is not a true "periodicity". Indeed, 111 lunations before the eclipse of 1945 July 9 we had the New Moon of 1936 July 18, when \*no\* solar eclipse took place. Neither was there an eclipse at the New Moon of 1963 June 21, 111 lunations after the eclipse of 1954 June 30.

Or consider the famous total eclipse of 1991 July 11. There was only a partial solar eclipse 111 lunations earlier, on 1982 July 20; and there was also only a partial solar eclipse 111 lunations later, on 2000 July 1. No parallel eclipse paths here!

The New Moon of 1945 July 9 occurred 14 hours AFTER the Moon passed through the ASCENDING node of its orbit. And the New Moon of 1954 June 30 occurred 11 hours BEFORE the Moon passed at the DESCENDING node. This explains why both eclipses took place in the northern hemisphere of the Earth.

Joerg writes that the eclipses of 2017 Aug 21 and 2026 Aug 12 have similar eclipse paths. (They too are separated by 111 lunations). However, I disagree. The paths of these eclipses are very different. The eclipse of 2017 Aug 21 will have  $\Gamma = +0.44$ ; its central line will cross the United States and reach a maximum latitude of  $45^\circ$  North. The path will not reach Europe. On the contrary, the eclipse of 2026 Aug 12 will have  $\Gamma = +0.90$ . Its path will pass very close to the North Pole and cross Spain. Very different from the 2017 eclipse! Jean Meeus

**Bug with my Javascript solar eclipse calculator**

From: Chris O'Byrne To: SOLARECLIPSES@AULA.COM Date: Fri, 20 Dec 2002 18:24:20

Folks, Thanks to Glenn Schneider, who has just pointed out a bug that is in my Javascript solar eclipse calculator at - <http://www.chris.obyrne.com/Eclipses/calculator.html>

The bug is that the displayed times of second and third contact are wrong by a couple of seconds (maybe 3 or 4 seconds).

The details are that the calculator is based on the one I wrote for the 1999 Aug 11 and 2001 Jun 21 eclipses. In particular, for the 2001 Jun 21 eclipse, I added in Lunar Limb corrections to the calculator (ref <http://www.chris.obyrne.com/Eclipses/2001curves.html>). I forgot to properly

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disable the code that did the lunar limb corrections when I updated the calculator for the 2002 eclipse. In other words, the times of second and third contact are being "corrected" using the lunar limb profile of the 2001 Jun 21 eclipse!!!

Doh! :(

Of course, I tested the calculator, and checked it's results against Fred Espenak's results, before putting it on the Internet - I must have happened to test it at places where the lunar limb corrections were essentially zero!!!

BTW thanks for everyone who has given me feedback on the calculator - I never realised that it was quite as popular as it seems to be!

I will be updating the calculator in time for future eclipses - I want to write a single calculator that will deal with a number of eclipses at the one time, but the current code simply isn't good enough for the purpose. I've rewritten the code in "C", and I'll create a Javascript translation when I'm happy with it. Chris.

### Error in Morsels II

From: Jean Meeus To: Solar Eclipses  
<solareclipses@aula.com> Date: Fri, 20 Dec 2002

To those who have my second "Morsels" book (2002):

There is an error on page 97. In the paragraph starting with "During the same period...", instead of "in the Pacific Ocean off the coast of Peru" read "in the Indian Ocean southeast of Sri Lanka".

My apologies for this error. Think I am becoming old and should stop writing...! Jean Meeus

From: Glenn Schneider

Jean Meeus wrote: ... Think I am becoming old and should stop writing...! Jean Meeus

Absolutely Not!!!

Your work has been truly a guiding inspiration for many of us. One can unequivocally recognize a labor of love. I grew up with the Meeus, Grosjean and Vanderleen Canon\* by my bedside dreaming of far-off eclipses in the distant future (many of which are now in my past)! I am QUITE sure that as an early teen it was my desire to understand all the "funny equations" (to me at the age of 12-

13 they did look odd) that lead me then to W.M. Smart and classics like W. Chauvenet, and later to Brown's treatise on the Lunar theory. Old, yes, but never tarnished with time. Your Canon stands among them, next to a copy of Oppolzer's in a place of honor, along with your later writings. Fred Espenak's efforts, today, are our bread and butter, and many of us have thanked him numerous times, with great sincerity, for all he has, and continues to do for us. But, I'm not sure I have ever expressed my gratitude, admiration, and guidance I have gotten from your publications. So let me do so publicly here. Please, don't stop. There still are empty shelves on my bookcase, with a large hole reserved in the M's. Glenn Schneider

\* To others: You may be an eclipse chaser if you do not have a copy, but you are not an Umbraphile in my book (which is Jean's).

From: solareclipsewebpages@btopenworld.com

Jean Meeus has been my "eclipse daddy" since I started my hobby. He helped me in the beginning when I started my interest in occultations, grazing occultations and solar eclipses. He is not only a good calculator, but most of all a wonderful person and a very very good friend! Best regards, Patrick

From: Peter Tiedt

I don't know how I ever got along without the Morsels Books!

Thanks Jean - and I am waiting for Morsels 3 Peter Tiedt

From: Fred Espenak

I must also add my 2-cents here along with Glenn and Patrick, especially during this Holiday Season. I can confidently point to two things that turned me toward a life-long passion for eclipses:

- 1) The 1970 TSE through the eastern USA
- 2) The 1966 "Canon of Solar Eclipses" by Meeus, Grosjean, and Vanderleen

And certainly, it is this second item which sparked my interest and desire to learn how to predict these celestial wonders. Meeus' Canon was my guide and inspiration for the very first eclipse programs I wrote way back in the mid 1970's. I began corresponding with Jean in the early 1980's. He was always most generous with his time and patient with my elementary questions about eclipse prediction. The breadth and depth of Jean's knowledge and

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understanding about solar system mechanics is unsurpassed. Happily, he has shared many of his most interesting discoveries with us through his recent Morsels books.

I can praise those books no more highly than to say that I have two copies of each: one copy for home and one copy for the office!

And I am especially pleased that I had the opportunity to meet Jean during a trip to Belgium in 1998 which was arranged through my dear friend Patrick who I'd only met two years earlier.

Jean, you must never stop writing! With luck I hope that we will meet again next May in Iceland!

Happy holidays and clear, dark skies to all! Fred Espenak

From: Jean Meeus

I thank Glenn for his good words about my works.

Well, then, I will continue. Maybe within a few years there will come a third 'Morsels' book. In this age of serious astrophysics, Gamma ray busters and galaxy black holes, there is still place for books and articles about subjects of the old, classical, mathematical astronomy. Jean Meeus

From: Rybrks1@cs.com

Dear Jean; Your thoughts will be more lucid at age 100 than our thoughts at any age. May you live long and keep writing and writing, ....please.

Merry Christmas to all, Happy Chanukah (spelling?), Happy New Year, Happy Eclipses to all. Happy Whatever.

Thanks to Joanne and Patrick for another great year of hard work. Sincerely, Raymond Brooks

### Flash photos of TSE

From: Klipsi To: SOLARECLIPSES@AULA.COM Date: Wed, 25 Dec 2002 19:24:20

a word about the use of flash for eclipse photos :

When eclipse blokes say "NO FLASHES" during totality, it is not because your photo will come out bad. It is because the flash will spoil their dark adaptation, and may get reflections on other mates' video or photos. So the flash is a disturbance factor, not a photographic error.

some flash fill-in photos may even be better .

If you are observing alone, or with flash-consenting people (e.g. for a fashion or magazine photoshoot), you may very well do a wide angle shot of totality, and throw in a flash fill-in, to illuminate a person or object in front observing the eclipse.

I dream of doing just that one day , "shooting" a celebrity, a king, a president during totality. Then I would not be just a paparazzo del cielo, "Paparazzo of the heavens", but a "Paparazzo in Heaven" . Maybe next November, not with a king, but with an emperor... penguin. Klipsi P.S. "bloke" and "mate" are words used in Australia, they mean "man" or "person".



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## New Moon

From: Joan Griffith To: HASTRO-L@LISTSERV.WVU.EDU Date: Sun, 22 Dec 2002

I know this is going to sound like a silly question, but has the new moon always been considered to be the dark of the moon, or is that simply the astronomical definition? (Recognizing, of course, that Jews & Muslims observe the first sight of the moon after that as the new moon)  
Joan

**The Moon by Dougy Miller**

From: Herb Solinsky

To Joan: Your question on the ancient meaning of "new moon" is addressed in remarks in the paper titled "Greek Astronomical Calendars and their Relation to the Athenian Civil Calendar" by B. L. van der Waerden in *The Journal of Hellenic Studies*, vol 80, 1960, pp. 168-180. A month begins with a new moon, so the issue is, in part, when did a lunar month begin in ancient times. On page 169 van der Waerden wrote:

"In Babylonia, the month began on the evening on which the crescent was visible for the first time after New Moon. More precisely: If on the evening of the 29th day of any month the crescent was visible, the month has 29 days; if not, the month has 30 days. The same rule still holds in Muslim countries. I shall call these months *\_observed lunar months\_*. The words of Geminus indicate that the Greek months originally were just observed lunar months. The months beginning with the conjunction will be called *\_exact lunar months\_* or *\_conjunction months\_*. These months are a theoretical construction; they could not be used in practice in classical times, because before Kallippos (330 B.C.) astronomers were not able to predict the true conjunction. Still Thukydides seems to use this kind of month in ii 28: 'During the same summer, on the first day of a month according to the moon (noumenia kata selenen) the sun was eclipsed.' He adds that only on such a day a solar eclipse is possible. The difference between the first days of an exact month and an observed lunar month is one or two days, or in exceptional cases three days." Herb Solinsky (near Dallas, TX)

From: Ariel Cohen

Since the "29th day" starts after dark (at least when it comes to lunar months), one should state the following: More precisely: If on the evening of the 30th day of any lunar month the crescent was visible, the past month had 29 days.

From: Steve McCluskey

In early medieval computistical writings, the New Moon was commonly considered to relate to the first appearance of the Moon. In discussing eclipses computists such as Bede of Jarrow and Hrabanus Maurus, quoted Pliny, *Nat. Hist.*, 2.10. 56, that solar eclipses only occur on "the primordial newest Moon." (sorry, I don't have the Latin at hand). Steve McCluskey

From: Sepp Rothwangl

primordium = first beginning, origin Sepp

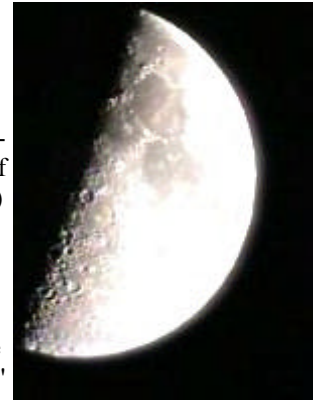
From: John M. McMahon

Pliny Maior 2.10.56 (from the Latin Library: <http://www.thelatinlibrary.com/pliny.nh2.html>):

Defectus CCXXIII mensibus redire in suos orbes certum est,

---> solis defectus non nisi novissima primare fieri luna,

quod vocant coitum, lunae autem non nisi plena, semperque citra quam proxime fuerint; omnibus autem annis fieri utriusque sideris defectus statis diebus horisque sub terra nec tamen, cum superne fiant, ubique cerni, aliquando propter nu-



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bila, saepius globo terrae obstante convexitatibus mundi. John McMahon Classics Le Moyne College

From: Herb Solinsky

To Joan: Further comments on new moon / start of lunar month:

There is an interesting paper titled "The Impact of Month-lengths on the Neo-Babylonian Cultic Calendar" by Paul-Alain Beaulieu on pages 66-87 of *Zeitschrift für Assyriologie*, vol 83, 1993. On page 66 Beaulieu wrote:

"In ancient Babylonia the day was reckoned from one sunset to the next. The monthly count was based on lunar phases, with the month beginning after sunset when the new crescent of the moon was seen again in the western horizon. This happened at the earliest one day, and at the latest three days after conjunction."

At the end of the above sentence is "2" (footnote) which states the following (same page, square bracket comments are in the journal, not from me):

"That the moon never disappeared for more than three days following conjunction was evidently known to Assyrian and Babylonian astronomers, as shown in H. Hunger, *Astrological Reports to Assyrian Kings* (SAA 8, 1992), text 346, a report sent by the scholar Asaredu the younger: 'On this 30th day [the moon became visible]. The lord of kings will say: "Is [the sign?] not affected?" The moon disappeared on the 27th; the 28th and the 29th it stayed inside the sky, and was seen on the 30th; when else should it have been seen? It should stay in the sky less than 4 days, it never stayed 4 days.'"

On page 87 Beaulieu wrote: "Even after the 6th century B.C., when Babylonian astronomers developed the mathematical schemes which enabled them to calculate month-lengths in advance, it is probable that observation remained the sole authoritative way of fixing the beginning of the month."

The Babylonians developed methods of computation whose purpose it was to determine the first visible crescent, not the astronomical new moon. The Greeks devoted more attention to determine the astronomical new moon. Herb Solinsky near Dallas, TX

From: Herb Solinsky

To Joan: Concerning the ancient meanings of "new moon", Josephus has something to add when he gives his paraphrase in Greek to I Samuel 20:27, which the New American Standard Bible translates, "And it came about the next day, the second [day of] the new moon that David's place was empty ...". Note that this translation states "new moon" rather than "month" for the Hebrew CHODESH because the Hebrew syntax is not the same as it would have to be for it to be translated "second day of the month", unless one were to claim that the Hebrew text is corrupted (and similarly corrupted in verse 34 where the same translation also states "new moon" rather than "month", sticking to the Hebrew text as we have it). Josephus corroborates this translation as we indicate below.

In the Loeb Classical Library series of Josephus, volume 5, translated by Henry St. John Thackeray and Ralph Marcus (*Antiquities* 6:236), bottom page 283 and top of page 285, Josephus (in translation and paraphrase of I Samuel 20:27) writes:

"But when, on the second day of the feast of the new moon, David again did not appear, he asked his son Jonathan why, both on the past day and on this, the son of Jesse had been absent from the festive meal."

The Greek word that Josephus uses for "new moon" in the above translation is "noumeenia", not the Greek word "meen" which means "month". Thus the New American Standard Bible, taking the Hebrew syntax as it is, translates it so as to agree with Josephus who chose the Greek word for "new moon" rather than the Greek word for "month". The William Whiston translation is very bad here because he translates it as though Josephus used the other Greek word (meen).

The book *Studies in Hebrew Astronomy and Mathematics* by Solomon Gandz (New York: KTAV 1970) contributes to

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this. On page 36 Gandz wrote:

"There can be no doubt that 'on the morrow of the second new moon' [verse 27] has the same meaning as 'on day of the second new moon' [verse 34] and that both phrases refer to the second day of the new moon festival, on which a festive meal was given at the King's table and in which David was supposed to take part."

Within the above quote from Gandz, I have added the items in square brackets, and the two expressions enclosed within apostrophes have, in Gandz' work, the Hebrew text rather than the literal translation that I have substituted. Gandz discusses this chapter and Jewish commentaries upon it during the past 1700 years.

Verses 5, 12, and 19 mutually corroborate the fact the David and Jonathan planned to get back together after both days of festive meal were completed. Perhaps the month before the one that was ending had 29 days, so they were expecting this month to most likely have 30 days. The chapter implies an uncertainty of which of the two days would be the start of the new month, i.e., the festive celebration that they called the "new moon" in advance, or the festive celebration that is called the "second new moon".

If they were using a calculation to determine the start of the next month, there would have been no point in having two successive days of festive meals associated with the new moon. The history of astronomy indicates that no society had the ability to calculate the time of conjunction at about 1000 BCE when David and Jonathan lived. Thus "new moon" in the Bible is not the conjunction or astronomical new moon. Herb Solinsky near Dallas, TX

From: dmeadows@IDIRECT.COM

Salve, What evidence is there for this on the Greek side? I find it difficult to believe that the easiest method for matters calendrical (i.e. looking for the first sign of the visible new moon) would give way to something mathematical, especially when that something mathematical was essentially calculating darkness (which is of no use to anyone). dm

From: Herb Solinsky

Reply to David Meadows: Below you ask for evidence on the Greek side, with respect to calculating the astronomical new moon, and you also ask what use there would be to know the astronomical new moon for the ancients.

(1) The use would be to predict the solar and lunar eclipses, although solar eclipses (here conjunctions are involved) would certainly be more difficult, especially because it entails the distance from the moon to the earth and knowing where the moon's shadow will reach the earth, and the ancients could not really predict the shadow path. Hence the prediction would more likely be of a probable solar eclipse. There is a genuine distinction between the desire to predict probable solar eclipses compared to predicting every conjunction. The only conjunctions that are visible are solar eclipses.

(2) The evidence on the Greek side was stated in an earlier email of mine today. Notice the following:

See the paper "Greek Astronomical Calendars and their Relation to the Athenian Civil Calendar" by B. L. van der Waerden in The Journal of Hellenic Studies, vol 80, 1960, pp. 168-180. On page 169 van der Waerden wrote:

"In Babylonia, the month began on the evening on which the crescent was visible for the first time after New Moon. More precisely: If on the evening of the 29th day of any month the crescent was visible, the month has 29 days; if not, the month has 30 days. The same rule still holds in Muslim countries. I shall call these months observed lunar months. The words of Geminus indicate that the Greek months originally were just observed lunar months. The months beginning with the conjunction will be called exact lunar months or conjunction months. These months are a theoretical construction; they could not be used in practice in classical times, because before Kallippos (330 B.C.) astronomers were not able to predict the true conjunction."

Thus Bartel L. van der Waerden points to 330 BCE as the time when Greek mathematical astronomical knowledge advanced to the point of predicting the astronomical new moon (in contrast to only predicting probable solar eclipses).

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Of specific interest is the paper by John M. Steele titled "Solar Eclipse Times Predicted by the Babylonians" in Journal for the History of Astronomy, vol 28, 1997, pp. 133-139. The oldest Late Babylonian solar eclipse prediction in his list is in 333 BCE. Steele analyzes the 61 available predictions. The terminology used by the Babylonians shows that a solar eclipse was to be "watched for", showing an uncertainty that it would be seen. Less than half were seen.

The interested reader would enjoy John M. Steele's book Observations and Predictions of Eclipse Times by Early Astronomers (2000). Herb Solinsky near Dallas, TX

From: Joan Griffith

Oh Herb! This is the first time I have heard of a SECOND new moon. The first one is bad enough. You are not advocating that the full moon is the new moon? Joan

From: Joan Griffith

Aren't the astronomical new moons actually eclipsed moons? Joan

From: Herb Solinsky

Reply to Joan: Concerning the "second new moon" in a posting by me yesterday

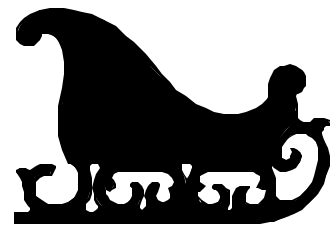
A very popular book among Jews, which should be available in most significant libraries and in all Judaica bookstores, is The Comprehensive Hebrew Calendar by Arther Spier. In both of the editions that I have (there is a newer edition that I do not have), on pages 11-12 there is a discussion under the heading THE "SECOND HOLIDAYS" OF THE DIASPORA. My way of explaining the essence of its contents (which is a blending of several sources that I've read on this matter) now follows.

Since it was anciently not known in advance on which of two successive evenings the new crescent {"new mo on"} would be seen (admittedly, bad weather could prevent it from being seen on both evenings, but no month was permitted to have more than 30 days), the first of the two evenings began the new moon celebration regardless of whether it was seen. If it was not seen on the first evening in ancient Israel, then the second evening began the "second new moon" celebration which also lasted one day (though the extent of its celebration outside the priestly realm is not well documented). The extent of the celebration on these days is not discussed in detail in ancient sources. See II Kings 4:23 and Amos 8:5 for indications. The only biblical evidence of the "second new moon" was presented in my email posting from yesterday, and it is based upon the Hebrew syntax in I Samuel 20:27, 34 (and additional implications elsewhere in the chapter), and Josephus corroborates this as explained yesterday.

Whenever the first day of the seventh month is shown for each year in Arthur Spier's book, the printing shows "Rosh Hashanah" (meaning, "head of the year", or "beginning of the year", a name of this day that comes from tradition rather than the Bible) under BOTH the first day of the seventh month as well as the second day of the seventh month. This "double holy day" is considered a historical vestige from the time in the distant past when observation alone made advance knowledge of this day unknowable, so that for Jews too far away from the central place (Jerusalem) where the new moon of the seventh month was officially declared by the blowing of the trumpets by the priests, those Jews celebrated two successive days, so that whichever of the two was "correct" as known in Jerusalem, they would have kept the "correct" day as well as another day next to it. Even Jews in Jerusalem would have kept two successive days at the start of the seventh month if the first day was not declared "Rosh Chodesh" (meaning "head of the month" or "sanctified new moon"). Spier's book also declares the other holy days as "double days" (celebrating two successive days instead of one for Jews outside of Israel), except for the Day of Atonement, not wanting to "impose" two successive days of fasting!!

This subject is discussed on pages 32-74 of Studies in Hebrew Astronomy and Mathematics by Solomon Gandz. This is a reprint from Jewish Quarterly Review, New Series, vol 40, 1949-1950. In the course of these pages, Gandz engages in some speculative ideas, and he typically does not warn the reader when he speculates (a real problem for the layman). Be

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cautious!! He mentions other references on this subject, and if one investigates, it is easy to find other references in standard Jewish sources. Herb Solinsky

From: Joan Griffith

Hi Herb, I had heard about the double holy days, but did not put it together with calendar questions. Rather, my impression was that they were being super-religious (or superstitious) in observing the days twice. Now it appears they had a good reason for doing so.

Joan Nothing repeats in the same way. Every moment is unique and newborn. --S.R.

From: Bob Garfinkle

Hi to all on the list, Since very ancient times, Jews have celebrated all holidays 2 days in a row. This was mainly to ensure that the celebration was held on the proper day. Remember that communications were very slow in olden times and the message, via hilltop bonfires, spread the word from the priests in the temple in Jerusalem that it was time to celebrate what ever the holiday was. Many holidays do commence with the first sighting of a crescent Moon (new Moon to them). Some are then based on a certain number of days after the previous festival. For example: the start of Yom Kippur (on 9 Tishrei) is 9 days after the start of Rosh Hashanah (on 1 Tishrei). You have to establish Rosh Hashanah (by first sighting of a "new Moon") in order to celebrate Yom Kippur on the correct day. Therefore, even today both holidays are celebrated for 2 days by observant Jews just to, as we might say in modern terms, "to cover your bases".

Take care and be thankful that you don't have to buy Xmas presents to cover 2 days. Bob Garfinkle 32924 Monrovia Street Union City, CA 94587 (510) 489-4779 [ragarf@earthlink.net](mailto:ragarf@earthlink.net)

From: Joe Kress

All: Not yet mentioned in this thread is the Chinese calendar. Throughout its history, from its earliest surviving records to the present day (in the traditional calendar), the conjunction of the sun and moon (astronomical new moon, or as Joan implied, the dark moon) has occurred on the first day of every month. Indeed, if a solar eclipse did not occur on that first day, the astronomical equations used to predict the new moon needed to be revised. Over 50 such revisions of the Chinese calendar are known. These mathematical techniques were always the best available, including the adoption of foreign methods. Thus Muslim techniques were adopted by Kublai Khan's Yuan dynasty when it overthrew the Southern Song Dynasty in 1279 and European techniques were adopted from the Jesuits by the Qing Dynasty (pronounced ching) when it conquered the Ming Dynasty in 1644 (note that neither the Yuan nor Qing Dynasty was native to China--both conquered China from the north).

I hypothesize that this use of the dark moon began as the midpoint between the last visibility of the moon at dawn and its first visibility at dusk, noting that the same day resulted whether only one day intervened at the summer solstice or three days at the winter solstice. The winter solstice has always been the preeminent solar point of the year, and has been continuously, albeit indirectly, observed by gnomons since the second millennium BC--its exact instant was calculated by interpolation of several observations before and after it. Also throughout its history, the Chinese day has been midnight-to-midnight at the then current Chinese capital (where all calendrical treatises were written)--midnight being midway between sunset and sunrise. Note that in all three cases (dark moon, winter solstice, midnight), the event was interpolated, not directly observed.

The earliest calculated Chinese calendar was the sifen (quarter remainder) calendar, so named because it assumed that the average number of days in a solar year was 365 and a quarter. It was adopted about 485 BC and used the Rule Cycle, which assumed that 235 months equaled 19 solar years, known in the West as the Metonic Cycle. Nearly complete records of Chinese months exist back to 841 BC, showing that before 485 BC, the intercalary month was inserted irregularly, with anywhere from one to six years between intercalary months. It was inserted shortly before the winter solstice as a 13th month immediately after the 12th month. The new moon day may have also been irregular before 485 BC, but there is no indication that any month ever intentionally began on the last or first visibility of the moon. Of course, we are hampered by the

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burning of most books during the short-lived Qin Dynasty (221-206 BC), which was the first to unify China. (Names for China in European languages derive from Qin, pronounced chin.) But the earliest surviving Chinese records (or writing of any kind) on oracle bones (cattle shoulder blades or tortoise bottom shells) from about 1300 BC do not contradict the above. Joe Kress

From: Joan Griffith

Thank you Joe. That is just the kind of info I am interested in. Joan

From: Joe Kress

All: Somewhat applicable to the term "new" moon: Dynastic Egypt began its (lunar, not solar) month with the last visibility of the moon at dawn (and its day at sunrise). Currently, south and east India begins each month of its lunisolar (not solar) calendar at new moon (dark moon) and north India begins its month at full moon. In both cases the conjunction/opposition is calculated using a day beginning at sunrise at Ujjain (75 degrees 46' 6" East longitude). For more information on the extremely complex Indian (Hindu) calendars see <http://www.math.nus.edu.sg/aslaksen/projects/lcl.pdf> (1.22MB). Joe Kress

From: joanneco@MAINE.RR.COM

Parker believed that the Egyptians considered the last visibility of the moon to be the "new moon" as some African tribes (the Maasai, iire) do. However, festival calendars indicate the full moon was celebrated on the 15th day which is consistent with the new moon being the first visibility after the conjunction. Joanne Conman

### 2005 eclipse

From: Jay.M.Pasachoff@williams.edu To: solareclipses@aula.com Date: Sun, 22 Dec 2002 20:52:49

Now that 2003 is around the corner, the annular/total eclipse of 2005 is only about 2 years off. And cruise ship companies plan their itineraries that far in advance! Is anybody working on getting a ship to the middle of the Pacific for that brief totality? Jay Pasachoff

From: Glenn Schneider

FYI, About 2 months ago I contacted a tramp steamer company which does 2-week cyclical runs on a passenger/cargo ship which can originate from Tahiti - just as a preliminary "feeler". The 2005 date was a bit too far off their screen, but I was preparing a detailed "proposal" for their use of their new ship for this purpose. The 2003 eclipse has taken a bit of effort (!) but I will be getting to that aspect of 2005 in the months ahead. I'll keep you posted, of course. I do suspect other, longer distance, cruises will emerge. -GS-

From: Alejandra León-Castellá

Hi everyone, We have been looking into organizing a cruise that will also visit National Parks in Costa Rica and Panama for that eclipse. There will be more information in a couple of months when the schedules for 2005 are set and we studied the path coordinates closer to Costa Rica. Alejandra Leon-Castella Fundacion CIENTEC

From: Raymond Badgerow

Hi Jay, I did a google search and found the following:  
<http://www.eyeonthesky.com/astrocruises>  
<http://www.skyscapes.com/TravelOps/Upcoming.htm>  
<http://www.offshoreodysseys.com/areas/eclipse.shtml>  
Ray Badgerow



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From: Egan Mark

I am assuming this cruise would stay near Costa Rica and Panama and thus be under the annular eclipse.

The point of "zero" totality ("Willcox point" as Klipsi calls it) is not all that far away from the Galapagos Islands. Is a cruise to this point (perhaps visiting Costa Rica, Panama and the Galapagos as well) feasible?

I think a flight to this point had been discussed but quickly rejected.... I hope to be there.... Mark!!!!

From: Alejandra León-Castellá

Yes, our plan is to stay close to both countries -Costa Rica and Panama- since this is the usual route for this cruise. Galapagos is rather far away... Alejandra

From: Crocker, Tony (FSA)

The zero totality point is about a 600 mile detour, either west from Costa Rica/Panama or north from the Galapagos. I too would be most interested in a Galapagos combination, but I think that is rather unlikely. The ships there are small and dedicated to short trips among the islands, especially for scuba divers.

I still think we are likely to see one or more large cruise ships repositioning in April from the Caribbean through the Panama Canal to San Diego/L.A. before the Hawaii and Alaska cruise seasons. A diversion to the totality path could easily be substituted for one of the Mexican ports on this itinerary. I believe a couple of cruise ships did this in the opposite direction in October 1977.

From: KCStarguy@aol.com

Hmmm so totality is only 600 miles away from the Costa Rican coast? Phil Harrington's book did not show where it would be total but has it listed in the Pacific.

I would think cruises would be able to do something but they are so inflexible.

I would look for such a cruise for 42 seconds of totality to see totality. I would hate to miss even that small amount of totality if it is doable. Annulars are nice but is it not the same as totality.

I just hope it is not a 30 day cruise if ones come about. I wonder how long a cruise it would be?

How close a annular will it be for those in Costa Rica? will it be like 1984? Dr.Eric Flescher

From: Odille Esmonde-Morgan& Warwick Lawson

Why don't you all get together and see if you can hire a small cruise ship or other boat of some type? Maybe something could be hired locally in Costa Rica, especially if it is only 60 kms offshore. I do realise the smaller the ship the less stable for photography, but should be OK for hand held video of totality.

Surely if there are enough of you and you approach enough tour operators with your wants/needs you might do some good. Odille Esmonde-Morgan Canberra, Australia

From: Crocker, Tony (FSA)

The 42 seconds would be way out in mid-Pacific (10S, 119W), far from any usual cruise routes. By Emapwin the mid-morning path has 20 seconds of totality about 1,000 miles SE of Tahiti. That is too far and the wrong direction for the Tahiti cruise ships. Some of them go west to Samoa or NE to the Marquesas. The Marquesas route stops a day at Tuamotu,

*(Continued on page 33)*

## SETalk

which is in the 2010 totality path.

The afternoon "Willcox Point" is 600 miles west of Panama and 600 miles north of the Galapagos. The standard repositioning cruises from the Caribbean to San Diego/L.A. are 14 days, but are usually attractively priced because they are at sea about half the days. I think this is the commercially realistic shot, even though only 5-10 seconds of totality. It would still be interesting to see a 1986-type chromosphere ring and a sharp defined shadow like the people in Outback saw this time.

I would hope to see this defined over the next 6 months or so. I think many of us may for time or money reasons want to choose one but not both of 2003 and 2005. Glenn Schneider's Croyden flight is well worth considering. It will include the Antarctic overflight and I'd be interested in visiting Melbourne and Tasmania at that time of year, based upon how much we enjoyed other parts of Australia in 1997. Like this year the trip would include Thanksgiving (U.S. holiday) and thus save a couple days vacation time.

But 2003 will be expensive (Croyden will undoubtedly charge a premium for window seats during the eclipse), possibly as much as this year as we used Delta mileage to Africa but can't do that to Oz. The 2005 14-day cruise might go for as little as \$2,000 per person from American gateway cities.

From: Vic & Jen Winter - ICSTARS Astronomy

I disagree. Those ships which make the trek out to the Galapagos do so from Ecuador. You don't fly into the Galapagos, but rather travel by one of these charters all the way out from the mainland. The trick is going to be in determining the traversability of the waters in the 600mile diversion, what the logistical requirements are and if it's feasible with the ships typically used to get there, the enthusiasm and the adaptability of the charter service contracted. We'll be working on that later.

2003 and 2004 come first. Clear Skies, Jen Winter - Owner

From: Klipsi

hey, how about a Kon-Tiki style drifting raft ?

Welcome aboard the Kon-Klipsi .

### More Lunars or Solars?

From: Rybrks1@cs.com To: SOLARECLIPSES@AULA.COM Date: Mon, 16 Dec 2002 06:48:01

On eclipse day on Stuart Hiway one of the gals (Denise Obert) asked me if there are more solar eclipses or more lunars? At first I answered there must be more lunars since the Earth casts a larger shadow. But then the Earth also presents a larger target for the Moon's shadow, so I guess that is a wash.

Since the Sun tugs harder on a New Moon versus a Full Moon, Full Moons should average a bit closer to Earth so I settled on more lunar eclipses. I am counting even the smallest partial solar or slightest penumbral as an eclipse.

When I got home I saw that some of the tables presented by Jean Meeus and Guy Ottewell also suggest there are more lunars but sampling is a bad method to invent a general rule. I am curious to 1) the answer and 2) the reason behind it. Ray Brooks

From: Geoff

There's a small section on this in the book "Totality" by Littman, Willcox & Espenak, and there's a nice diagram showing why Solar eclipses outnumber lunar eclipses. If you include penumbral lunar eclipses, the ratio is almost equal. It says that the main thing which throws you off is the fact that lunar eclipses are visible from a far larger area on Earth, so more people have seen a lunar eclipse than a solar eclipse.

## SETalk

From: Klipsi

on the other hand, we solar eclipse chasers tend to see more solar eclipses than lunar eclipses.

e.g. for myself, I do travel accross the planet for a solar eclipse, but have never travelled for a lunar eclipse, except up the hill a few miles from Geneva. So , even though lunar eclipses are visible from a wider area, and more people see lunar eclipses, I still saw more solar eclipses than lunar eclipses. This is probably true for most of us, as this is the SEML, not the LEML ;-)

I understand that certain rare lunar eclipses may also be worth a trip, such as exceptionnally long or dark ones (mid/July 2000) or one that would be visible on special date (Xmas 2000 ). How about an eclipse on a February 29 ? Jean Meeus ?

but I doubt anybody would travel thousands of miles for a penumbral lunar eclipse ...hehehe

hey, then again, if a penumbral lunar eclipse would occur on a Feb. 29, it would be quite a rare event . Klipsi

From: Peter Tiedt

Jan Meeus discusses the frequency of eclipses of all types extensively in his "Morsel" books.

IMHO these are compulsory library items for all serious umbraphiles, and at a lousy \$20 each are really excellent value for money.

I refer to mine all the time. Peter

From: Jean Meeus

On pages 138-139 of my second Morsels book (2002), I give the (short) list of \*solar\* eclipses occurring on bissextile day during the years 0-3000, ending with the remark:

"We did not search for \*lunar\* eclipses on bissextile day, leaving this as an exercise to the interested reader".

Well, now for the lazy :-> reader, I have looked for \*lunar\* eclipses on bissextile day, during the period 1600-2600. I found only two cases:

-- On 1896 February 28, partial lunar eclipse, magnitude 87 percent. Well, Feb 28 doesn't seem to be bissextile day, but maximum eclipse took place at 20h UT, so in central and eastern Asia the eclipse took place on the morning of Feb 29, local time;

-- on 2268 February 29, total lunar eclipse, magnitude 1.66.

So, folks, "you" have to wait for more than two and a half century for the very next lunar eclipse on bissextile day.

"Klipsi" wrote: "I understand that certain rare lunar eclipses may also be worth a trip, such as exceptionnally long or dark ones (mid/July 2000)". -- Well, the eclipse of 200 July 16 was almost the longest one of the period 1000-3000 (that of 1859 Aug 13 was 3 seconds longer!!). The duration of total phase was 106.41 minutes. But for practical purposes such an eclipse can hardly be considered to be more "important" than an eclipse with a totality of 104 or 105 minutes. Certainly it is not more spectacular. So a trip is not worth while for such "extra long" total eclipses! Much more interesting would be lunar eclipses during which a bright star or planet is occulted. Jean Meeus

From: Fred Espenak

*(Continued on page 35)*



## SETalk

### Total Lunar Eclipse Triads & Tetrads

"Klipsi" wrote: "I understand that certain rare lunar eclipses may also be worth a trip, such as exceptionnally long or dark ones (mid/July 2000)". -- Well, the eclipse of 200 July 16 was almost the longest one of the period 1000-3000 (that of 1859 Aug 13 was 3 seconds longer!!). The duration of total phase was 106.41 minutes. But for practical purposes such an eclipse can hardly be considered to be more "important" than an eclipse with a totality of 104 or 105 minutes. Certainly it is not more spectacular. So a trip is not worth while for such "extra long" total eclipses! Much more interesting would be lunar eclipses during which a bright star or planet is occulted.

If "beauty is in the eye of the beholder" then surely "interest is in the mind of the contemplator." Pat and I thought that the exceptionally long total lunar eclipse of 2000 Jul 16 sounded like a fascinating event to observe, even though it meant flying nearly 1/4 of the way around the globe since it was not visible from Maryland. After all, a total lunar eclipse hadn't lasted this long since 1859 and it would not be exceeded for over a thousand years! Besides, it also presented an excellent excuse to take a vacation in Hawaii! You can read all about our eclipse experience at:

<http://www.mreclipse.com/LEphoto/TLE2000Jul16.html>

We had another motivation for "chasing" this lunar eclipse. We had seen and photographed the total lunar eclipse of 2000 Jan 21 (see: <http://www.mreclipse.com/LEphoto/LEgallery2.html>), so we wanted to observe the Jul 16 event for the novelty of witnessing two consecutive total lunar eclipses. We took this little obsession one step further by flying to Athens six months later (2001 Jan 9) to see the third consecutive total lunar eclipse in the triad. Of course, we also toured Athens extensively and visited many fantastic archeological ruins. Unfortunately, I just haven't found the time to post a web page about our 2001 Jan 09 eclipse trip. Maybe one of these days!

Total lunar eclipse triads are not too unusual. Previous triads over the past 20 years include:

- 1) 1992 Dec 09, 1993 Jun 04, 1993 Nov 29
- 2) 1989 Feb 20, 1989 Aug 17, 1990 Feb 09
- 3) 1985 May 04, 1985 Oct 28, 1986 Apr 24 and 1986 Oct 17 (4 totals in a row!)
- 4) 1982 Jan 09, 1982 Jul 06, 1982 Dec 30

The next triad is actually a tetrad (4 consecutive total lunar eclipses):

- 1) 2003 May 16, 2003 Nov 09, 2004 May 04, 2004 Oct 28

Jean Meeus discusses tetrads in "Mathematical Astronomical Morsels - I", Ch. 16.

Although "Klipsi" wrote that he never considered traveling any significant distance for a lunar eclipse, we find them to be incredibly beautiful. Furthermore, Nature has seen fit to provide us with total lunar eclipses during the very years when central solar eclipses are absent (Yes, 2003 is an exception to the rule with its extreme polar eclipses of May 31 and Nov 23). The fact that total lunar eclipses usually occur in years without central solar eclipses is, of course, a direct consequence of the geometry requirements of solar vs. lunar eclipses.

Has anyone on this mailing list succeeded in seeing all three eclipses of any previous triads? Has anyone even tried? - Fred Espenak

From: Peter Tiedt

I'll just stay a home and see them all ;-)

Most Europeans as well .....

From: Klipsi



(Continued on page 36)

## SETalk

Total Lunar Eclipse Triads & Tetrads Dear Fred,

sorry, I believe there is a misunderstanding, and I want to clarify this. I did NOT write

.... So a trip is not worth while for such "extra long" total eclipses! Much more interesting would be lunar eclipses during which a bright star or planet is occulted.

I DID write : I understand that certain rare lunar eclipses may also be worth a trip, such as exceptionnally long or dark ones (mid/July 2000)".

and when I wrote this I actually thought of YOUR trip to Hawaii. I DO think that this eclipse was certainly worth a trip, even to Hawaii ;-). Actually, I would have loved to get there, too, but had to work and stay in Geneva. (I did go to Canada however, for the following PSE.)

the following line was a reply by Jean Meeus. Whithout space between my quote and his reply it looked like the whole statement was from me.

"Klipsi" wrote: "I understand that certain rare lunar eclipses may also be worth a trip, such as exceptionnally long or dark ones (mid/July 2000)". -- Well, the eclipse of 200 July 16 was almost the longest one of the period 1000-3000 (that of 1859 Aug 13 was 3 seconds longer!!). The duration of total phase was 106.41 minutes. But for practical purposes such an eclipse can hardly be considered to be more "important" than an eclipse with a totality of 104 or 105 minutes. Certainly it is not more spectacular. So a trip is not worth while for such "extra long" total eclipses! Much more interesting would be lunar eclipses during which a bright star or planet is occulted.

MY original post was: on the other hand, we solar eclipse chasers tend to see more solar eclipses than lunar eclipses. e.g. for myself, I do travel across the planet for a solar eclipse, but have never travelled for a lunar eclipse, except up the hill a few miles from Geneva. So, even though lunar eclipses are visible from a wider area, and more people see lunar eclipses, I still saw more solar eclipses than lunar eclipses. This is probably true for most of us, as this is the SEML, not the LEML ;-). I understand that certain rare lunar eclipses may also be worth a trip, such as exceptionnally long or dark ones (mid/July 2000) or one that would be visible on special date (Xmas 2000). How about an eclipse on a February 29? Jean Meeus? but I doubt anybody would travel thousands of miles for a penumbral lunar eclipse ...hehehe hey, then again, if a penumbral lunar eclipse would occur on a Feb. 29, it would be quite a rare event.

so what happened, is, Jean Meeus replied, and accidentally did so in a way that made you think that I do not care about long total lunar eclipses, which is wrong. We both apologize for the misstipo. Please be assured I would have loved to be in Hawaii in July 2000!

as for chasing triads of lunar eclipses: I have, as I said from very beginning, so far never travelled overseas to a lunar eclipse. But if ever possible I did try to see them, IF they were visible from Geneva.

Examples:

-I did see the TLE in April 1996, in Geneva <http://eclipse.span.ch/april4.htm> (then I flew to the Easter Island for the following PSE)

-I did try to see the next TLE in October 1996, but only saw the beginning and then got clouded out (that was the TLE with bright Saturn nearby - wonderful!).

-I did see the PLE in March 1997, which was a deep partial, almost total. I do remember watching comet H-B during maximum eclipse. And I do remember the wonderful photo by spanish astrofotografer Juan Carlos Casado of comet HB "inches away" of M31, taken during full Moon in deep eclipse. <http://antwrp.gsfc.nasa.gov/apod/ap971125.html> for me, this was again in Geneva. At 4 AM! <http://eclipse.span.ch/march24.htm>

(Continued on page 37)

## SETalk

so that is not a triad, as the 3rd of the series was not quite total. ;-(

I did see the TLE in September 1997, from Geneva (after returning from Kangaroo Island Australia for the preceding PSE)  
<http://eclipse.span.ch/sept16.htm>

I did try to see the penumbral LE in early 1999, from Geneva. <http://eclipse.span.ch/310199.htm>

I did see the TLE in January 2000, did a live webcast from alpine ski resort Gstaad, at 4 AM with -12deg Celsius temp.  
<http://eclipse.span.ch/21.htm> . so yes, I did travel to see it, but actually I happened to be in Gstaad for 4 days of work, so it does not count as eclipse chase ;-)) on that night, thanks to the successfull webcast, I had over 40'000 visits on my website, resulting in 900'000 hits in 24 hours. Still my record!

I did promote the TLE in July 2000, with several friends worldwide doing live webcasts <http://eclipse.span.ch/july16.htm>

I did try to see the 2001 TLE <http://eclipse.span.ch/090101.htm> but had clouds.

and... I have done overseas trips for other lunar events, such as the rare april 1998 simultaneous occultation of Jupiter and Venus

<http://eclipse.span.ch/live.htm> on Ascension Island (flew with the RAF !), and the April 1999 graze occultation of Aldebaran in Littleton/Denver, Colorado

<http://eclipse.span.ch/18apr99.htm>

Oops ! Sorry, Pat, this may be offtopic ? ;-)) Fred, one last word : I admire you, you are my teacher, my master. I am your student ! Klipsi

From: Glenn Schneider

I actually would like to see such a TLE from about 240,000 miles along the Earth's umbral apex looking back toward the Sun. I suppose the chances of that are pretty nil, and growing smaller with time. Maybe my daughter will some day get the chance. -GS-

### Geographical Coordinates

From: Onderbeke Julien To: SOLARECLIPSES@AULA.COM Date: Wed, 01 Jan 2003 10:49:50

Hi everyone, For those who want to make calculations about eclipses, does anyone know a good link to listings of (accurate) Geographical Coordinates of most places in the World? (I'm now searching for places in Namibia). Greetings, Julien Onderbeke

From: Stephen Russell

You might have a look at <http://www.calle.com/world/>. Beware: from each country, you can navigate to a page with a table of city names but the positions given here are only to the nearest degree. You need to follow the link for each city to get more accurate information (usually to the nearest minute.)

I can't vouch for its accuracy, but the Australian/NSW places I've checked seem pretty reasonable. Namibia? Cheers, Steve.

From: Gerard M Foley

But what happened to the United States of America? Gerry

From: Stephen Russell



## SETalk

I was thinking the same thing. Seems to cover the rest of the world, but the USA is conspicuously absent. Cheers, Steve.

From: Dribalz@aol.com

A GLOBAL gazetteer at <http://www.calle.com/world> ? They left out America! Andrew Hans

From: Peter Tiedt

Julien Try the GEONet Names Server If you need a file on many many places in Namibia, send an e-mail off list and I will forward to you.

Peter Tiedt

From: Peter Tiedt

Sorry - I left the URL out of the previous e-mail

The GEONet names server can be found at

<http://www.nima.mil/gns/html/>

and also directly to ... [http://164.214.2.59/gns/html/cntry\\_files.html](http://164.214.2.59/gns/html/cntry_files.html) Peter Tiedt

From: Jean Meeus

I have the Microsoft "Encarta World Atlas" (a CD-ROM). It is a magnificent World Atlas, and you can set a "location sensor" on, with which you can read the geographical longitude and latitude of any point, either in degrees-minutes-seconds, or in degrees-and-decimals, at your convenience. The values are given to the nearest arcsecond or thousandth of a degree.

However, I do not know where you can obtain that CD. Jean Meeus

From: Onderbeke Julien

Thanks for the reactions on my question about geographical positions. The things I saw were very useful! Julien

From: Carter Roberts

Arial Geoscience Australia (<http://www.ga.gov.au/>) has a place name finder for Australia that gives coordinates to the nearest minute.

For the United States (also Antarctica) use the U.S. Geological Survey's Geographic Names Information System at <http://geonames.usgs.gov/index.html>. This gives coordinates to the nearest second (NAD27 datum). Carter Roberts

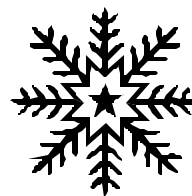
From: Klipsi

you could also try the famous site for observing satellites,

[www.heavens-above.com](http://www.heavens-above.com)

as it has a huge database of countries and cities, which then tells you the coordinates.

choose the country, then enter the city, and you are then invited to reconfirm city or choose neighbourhood area, confirm choice, and it will tell you which satellites you can observe, and that same page will confirm coordinates of chosen city.



*(Continued on page 39)*

## SETalk

It may be showing in decimals, check it out. Klipsi

From: Mark Alsip

Julien, If you enjoy working with databases, two sources (touched upon in earlier replies to your query) can give you more than enough data to create a wonderful geographic query tool. I'll apologize to the mailing list in advance, and warn you to stop reading now, if you're bored by computer jargon.

The U.S. National Imagery and Mapping Agency, NIMA, has a large set of downloadable "place name" files for non-U.S. countries and territories on the planet. ([http://164.214.2.59/gns/html/cntry\\_files.html](http://164.214.2.59/gns/html/cntry_files.html)). They've even got files for named places that are under water (not that I'd want to watch an eclipse from there). The data can be downloaded on a per-country basis and imported into Excel, MS Access, etc. (You do need to do a Unix-to-Windoze EOL conversion on the text files first).

There are 9709 named places in Namibia, for example, in the last update produced for that country (May 2002). The data is fascinating to browse if you're at all interested in geography or travel, and the metadata descriptions are, IMHO, very well done. The ability to find alternate names/spellings for the same place is particularly valuable. I needed to find a particular spot on a particular Bahamian island once and was able to do it through the database I built from the NIMA data (you wouldn't believe how many Green Turtle Cays there are in the Bahamas!)

You can filter out certain record types in the NIMA data sets. For example, you could just pull out bodies of water in Namibia as a starting point to finding eclipse paths across water (caution: this is Point data, not Spatial data. You can get the coordinates of some "central" point of a lake, but you won't get the shoreline boundaries).

The USA data is produced by the U.S. Geological Survey (USGS). (<http://geonames.usgs.gov/geonames/stategaz/index.html>). The record formats are NOT identical to the NIMA data, so if you combine them in a single database (I did this) you've got some work to do. But, importing a single state into Access or Excel is as easy as importing a country from the NIMA data. And like the NIMA data, you can filter the USGS data for record types of interest. For example, I want to photograph an eclipse over a church. My home state of Kentucky hosts maximum eclipse for the TSE of 21 August 2017. The USGS dataset for Kentucky lists churches and their coordinates. You get the idea...

There's far too much data in both sets to place it ALL in a "desktop" product such as Access or Excel. If you get really ambitious and want to do that, look at using MS SQL Server, Oracle, or (on Linux) Postgres. I combined all the NIMA and USGS data to get a database with over 8 million place names, then began supplementing it with waypoint and other data I've found on the web. I was in Namibia briefly in 2001 and was amazed that the NIMA data didn't have the coordinates for the border posts where I entered/exited. I found all these on a Namibian government web site later though. There are many advantages to creating your own database, if you can handle the headaches.

You can "go spatial" with this by linking it with "shape file" data from [www.esri.com](http://www.esri.com). The ESRI shape file specification includes tables in dBase format which can also be imported into Access, Excel, etc., though it's not for the faint of heart. (There are other spatial formats, I mention ESRI because the dBase tables have columns which are easily identifiable as links to NIMA or USGS data). Alternatively, it's not too hard to write some code to do spatial searches such as "show me all the cities within 25 kilometers of..."

Other fun projects you can do (once you have your own data) is write code to show sunrise/sunset for all the cities in a country, link to the WMO weather stations closest to places of interest and grab the latest weather reports, etc. (Sorry, I'm a geek and love it). Hope this helps, rather than confuses. Best of luck, Mark Alsip

Links:

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NIMA (non-U.S. data): [http://164.214.2.59/gns/html/cntry\\_files.html](http://164.214.2.59/gns/html/cntry_files.html)  
U.S.A: <http://geonames.usgs.gov/geonames/stategaz/index.html>

*(Continued on page 40)*



## SETalk

From: Crocker, Tony (FSA)

Emapwin maps have the same capability. Click on a point on the map and longitude and latitude in degrees and decimals will show in the upper right corner. The CIA maps can be zoomed to fairly fine detail, at which point many cities show on the map, plus river and coastline detail.

From: Peter Tiedt

Further to this ...

I have downloaded data from all the African countries from the NIMA website. After importing the files to Excel, I did queries and extracted all "populated places".

I am now in possession of data(sub)sets of populated places for the whole of Africa. If anyone needs this data, I am quite prepared to share ;-). I will need a CD - the 80 raw data files (zipped) for Africa are about 50 MB. The pop places extracts (in .txt format) 71 files = 18 MB., zipped = 5 MB.

BTW - I am looking for a canon of all eclipses in Saros 1 - 250 ... Peter Tiedt

### New Moon Jan 2003

From: Rybrks1@cs.com To: SOLARECLIPSES@AULA.COM Date: Fri, 03 Jan 2003 02:31:21

This New Moon marks the first New Moon since the June 2002 annular in Puerto Vallarta that is annular at the Earth's Vertical Centerline. All the New Moons (including Dec 4 2002) since June were total at the Centerline.

This New Moon passes beneath the Sun but will arrive on Earth in year 2760 in Saros 180 as a partial near the Antarctic Circle. This series will be 5 totals, 2 hybrids and the rest are annulars. The most central pass is year 3427 as an annular. The Saros ends in 4004 in the Arctic.

P.S. I constructed a Saros diagram of 2003 which illustrates associations of the New and Full Moons. If anyone would like a copy please request offline at RYBRKS1@cs.com Raymond Brooks

From: Rybrks1@cs.com

Patrick: This is an attachment so I am not sending it to the list. But it should appear fairly decent in the News Letter.

The Saros Diagram attached (MS Word doc) for 2003 shows all the New and Full Moons for the year. It illustrates why there are four Saros quadrants which have groups that are young and have yet to visit Earth and also, old groups that are fading away. The Saros groups are in two pairs on opposite sides. Each purple text box brackets a three month period for a Saros quadrant. Inspection quite easily shows why.

The year's half of New Moons which are centered about the New Moon descending node in November are all migrating up every 18 years. The quadrant of New Moons following the desc node are low (and migrating up) so they are arriving. The quadrant of New Moons preceding the asc node are already high (also migrating up) so they are leaving. The Full Moons in those quadrants have opposite (vs New Moons) elevation to the ecliptic plane but also move in the opposite direction so they too have the same Saros age (young or old) as the New Moons in that quadrant.

Legend:

Full Moons outside Earth's orbit with their date (CST) and their Saros number

New Moons inside Earth's orbit with their date (CST) and their Saros number

## SETalk

The nodes are shown as half arcs with a split horiz line. (November & May)

Earth at the nodes shown in a tan text box. Note movement from Nov 2002 to Nov 2003.

Migration direction for the half year of Moons is shown with a light green text box. The upper right Full Moons migrate down, as do the half year of lower left New Moons.

The elevation of the half year Moon passes is shown in brown text boxes. Full Moons for six months after November are high, as are the six months of New Moons prior to November.

The oldest Saros (low number) will be near the highest and lowest pass for the year. (March 3 and Aug 27) Subsequent months have a Saros number that is 38 higher. True for Full Moons and New Moons.

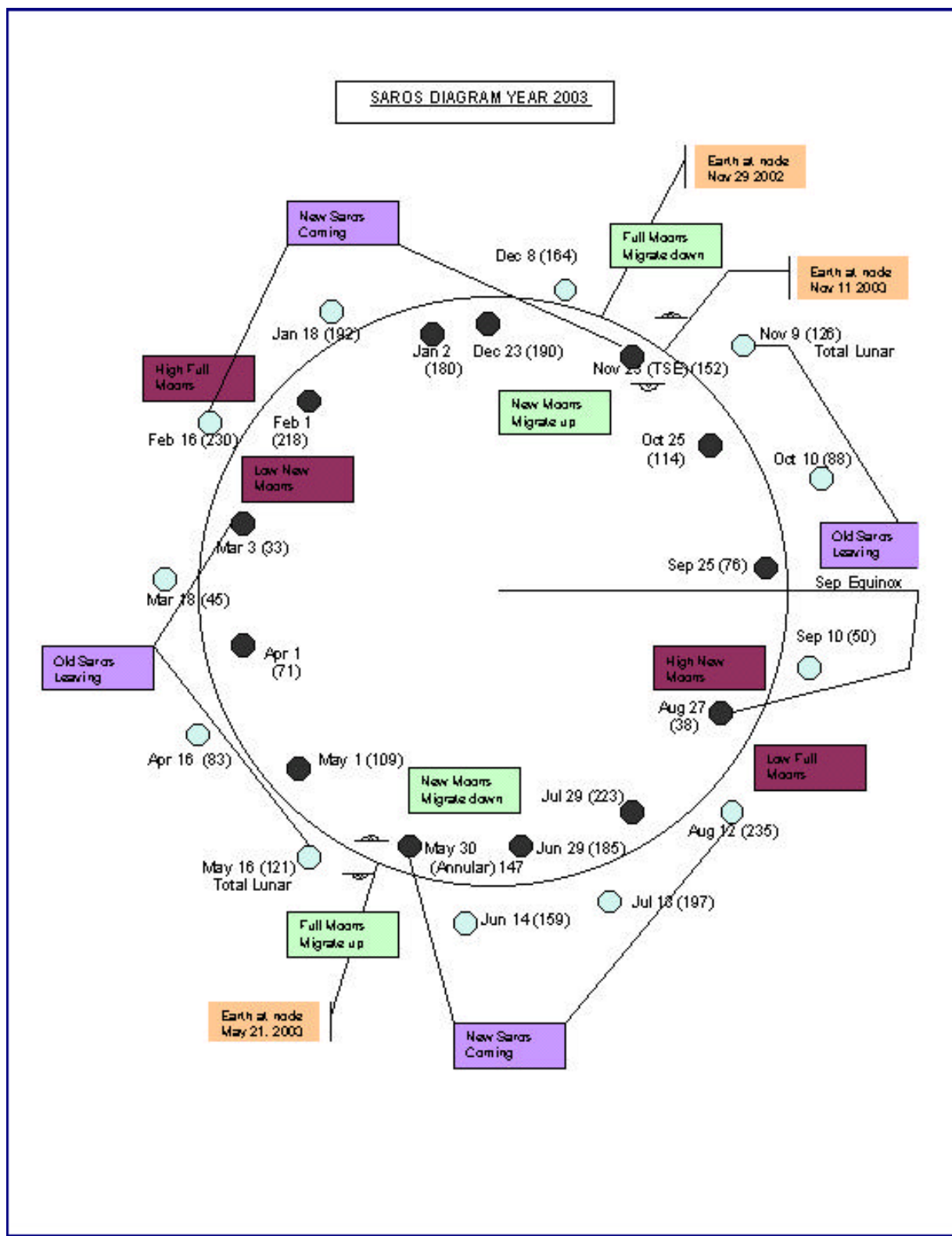
The Saros quadrants will always have the same positions relative to the nodes. For example, in year 2004 everything will simply be shifted a bit clockwise but the "Saros Leaving" quadrant will precede each node. Raymond Brooks



**All pictures  
by Joanne  
and Patrick  
Poitevin**



## SETalk



T  
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2**ECLIPSYCHOLOGY**

From: Jeffrey Rink

I am a Clinical Psychologist in private practice in Cape Town, South Africa with a special interest in ecopsychology. As such, I take clients of mine on wilderness trails in Southern Africa. These trails are psychotherapeutic in orientation. I viewed the eclipse from a different perspective- the symbolism and metaphor the eclipse represented. It was with this idea in mind that I took a group of 8 clients into Wilderness areas adjoining the Kruger National Park for 10 days. Participants included a PhD astronomer, an optometrist, a professional photographer, and an electronic engineer. I included a co- therapist on this trip, a psychologist with training in astrology. All contributed their respective knowledge to the phenomena we had geared ourselves up to witness. Most of our eclipse was 'eclipsed' by the clouds, but we were all afforded precious glimpses, framed by cloud, of the entire process. We all feared that the eclipse would be totally obscured from sight by the clouds, but were thankful and appreciative of the gift we had of observing what we could observe. Somehow, when we risked losing everything, what we did see was particularly special...and potentially addictive. I began to get a feel of what it's like to be an umbraphile! The eclipse was part of a process for us, not the entire process, a means to an end, not an end in itself, and formed a powerful backdrop to the rest of our ecopsychology wilderness experience. Interesting too to note that on our return to Johannesburg Airport, we saw a rainbow! Our journey then started with an eclipse- light and dark, and shadow, and ended with the full spectrum of colour!

I have been following the Solar Eclipse correspondence with interest over the last few months. It was here that I was exposed to the term "umbraphile" for the first time. I have since informed my colleagues in the fields of psychology and psychiatry of this new "phillia." Perhaps a new term can be added to the lexicon of eclipses, "Eclipsychology!."

Thanx for stimulating, informative discussions, Jeffrey Rink [shrink@worldonline.co.za](mailto:shrink@worldonline.co.za)

From: GJMadden

May I also suggest "Nephophobiaology" for our lexicon? madden/rochester

**2002 TSE observers in Angola, Namibia and Mozambique**

From: christian viladrich To: SOLARECLIPSES@AULA.COM Date: Wed, 01 Jan 2003 20:59:41

Here are some news for Angola :

A mission led by Serge Koutchmy (Astrophysical Institute of Paris/CNRS - France) observed the eclipse from two sites :  
 - Mavinga, S 15° 47' 31.7" / E 20° 21' 35.0" / alt 1184 m,  
 - Above the sea near Sumbe - in fact it was an airborne experiment - I can find the exact coordinates if usefull.

The ground observation was successul thanks to a cloud break right in time for totality. Data are being processed.

Unfortunately, we couldn't make any observation from the plane because of the clouds. The plane climbed up to 3500 m (maximum limit because the side door has been removed to allow undistorded observations) but the clouds were much higher, too bad ... Best wishes for 2003 ! Christian Viladrich <http://perso.club-internet.fr/viladric/>

**Eclipse stamps for exchange**

From: solareclipsewebpages@btoopenworld.com To: SOLARECLIPSES@AULA.COM Date: Thu, 02 Jan 2003 21:12:43

Dear All, We have some eclipse stamps and original eclipse enveloppes spare of South Africa 2002. Were there any eclipse stamps in Australia or in other countries in the path?

If so, please send us an e-mail so we can exchange. By the way, we still have eclipse stamps left of Iran 1999 and Zambia 2001. Best regards, Patrick



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2**Images of the December 4th TSE from Koolymilka, Australia**

From: Arne Danielsen To: SOLARECLIPSES@AULA.COM Date: Wed, 01 Jan 2003 17:41:20

Dear friends! December 4th's TSE from Koolymilka (Woomera Prohibited Area), Australia was a great success!!! Clear blue skies and a totally eclipsed Sun only 6-7 degrees above the horizon was an impressive sight. If it only could have lasted a bit longer... Watching a partially eclipse Sun setting over an almost perfect horizon was almost as impressive!!!!

Strong winds forced me to do some last minute changes to my imaging plans, but I'm nevertheless very pleased with the results. I have uploaded the images taken with my Canon EOS-D60/Takahashi FS-60C combo to my homepage. You can view them using this link:

<http://home.online.no/~arnedani/astronomy/astrophoto/eclipse/eclipse.htm>

Remember to click on the thumbnails in order to see the larger images together with the exposure data.

I hope to find time to supplement with some close up's of the prominences, a stacked image of the corona and maybe a short report before long! Best regards, Arne -- Arne Danielsen Langhussenter 15, 1405 Langhus, Norway mailto:arne.danielsen@oslo.online.no <http://arnedani.home.online.no/> N59° 45'14" E10°50'38" A115m

**Speechless in Geneva**

From: Klipsi Save contact To: SOLARECLIPSES@AULA.COM Date: Tue, 31 Dec

I almost had a heart attack !

I asked a friend who lives in South Africa if he had seen the eclipse .

here is his answer:

quote : " I'm sure you'll larf but I slept through it here. It was cloudy... " end quote. (speechless in Geneva)

Olivier "Klipsi" Staiger Geneva Switzerland tel +41.79.449 4630 <http://eclipse.span.ch> klipsi@bluewin.ch

From: Katherine Low

I met a German couple in Malolotja (Swaziland) and asked whether they had seen the eclipse. Their answer was: 'no we are not interested in this kind of mass events.' At the time of the eclipse they were in Cape Town but they added firmly that purposely they did not even want to have a look at the big partial eclipse, just to confirm that they would not like to participate in a mass event.

I had a similar reaction in Mhkaya (again Swaziland) where 2 Spanish joined us on the game drive. When asking whether they seen the eclipse the reaction was quite similar: 'such a hype, we don't want to be part of that. It is each time the same with eclipses (as reported by the media). Every time it is going to be the last of the century, the last of the decade , or something else...'

We may find this attitude strange. On the other hand, can we blame them if you see at what the media is publishing sometimes, or with the kind of notorious events such as the 'eclipse villages', or with a breed of 'eclipse chasers' that appears to come for the experience to get high, stoned and boozed before, during and after the eclipse? Kris Delcourte

From: Jean Meeus

There is something true in what Kris Delcourte writes: Every time it is going to be the last of the century, the last of the decade, or something else...'

That's the fault of the newspapers or other media.

There was a total solar eclipse in the eastern United States on 1970 March 7. Some newspapers (at least here in Belgium) wrote that it was the last total eclipse of the century.

When the total solar eclipse of 1973 June 30 occurred, they told that it was the last of the century.

The African eclipse of 1980 February 16 was, of course, the last total eclipse of the century.

And again, when the total eclipse of 1991 July 11 took place, newspapers informed us that it was the last of the century.

So, each time it is the last total eclipse of the century!! Surely the persons who wrote such thing missed something. Certainly they read some correct information, but then interpret it incorrectly. At the eclipse of 1970, for instance, the original information probably said that it would be the last total eclipse of the century IN THE EASTERN UNITED STATES. But



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this was not what the newspapers told.

And recently, I heard a similar error on the Belgian Flemish television. The lady speaker told about the total eclipse of 2002 December 4, and said that not before 28 years there will be another total solar eclipse in Africa. And, indeed, there will be a total solar eclipse in South Africa on 2030 November 25. In SOUTH Africa! But what about the African eclipses of 2006 March 29, 2013 November 3 and 2027 August 2? So I presume that the original message said "the last for 28 years in SOUTH Africa", or "in this country", and that was transformed to the last in Africa. So, now you understand why I am often ill-humoured.... :-) Jean Meeus

From: Mark Alsip

I blame a lack of science education. People don't seem to understand just how rare of an event it is. That keeps them from watching. And if you don't see it, you miss the other big reason to watch, the thing that will hook you forever -- how beautiful it is.

From: Evan Zucker

It's purely a matter of ignorance; I challenge you to find anybody making a comment like that after they've seen a total solar eclipse in person. I find that ignorance about many (if not most) subjects is quite rampant worldwide.

Also, never forget that the average IQ is 100. While there certainly are many ignorant intelligent people, there may be even more ignorance among the less intelligent. -- EVAN

From: Odille Esmonde-Morgan & Warwick Lawson

It is a somewhat 'gobsmacking'! I am amazed that anyone would want to ignore an event of such natural beauty. That said, as I mentioned earlier, we saw people driving away from Lyndhurst when the eclipse was well into the partial phases with only 10-15 mins to totality.

My other half wasn't really that keen to go, he only came along' to help me with driving' (and because I insisted). Now he's keen to go again. Odille Esmonde-Morgan

From: Harvey Wasserman

"gobsmacking"? lol! Yes it is. In Zambia, the son of our hosts insisted on videotaping \*us\* watching the eclipse (2001) and only glanced at the fully eclipsed sun after I insisted. He just continued videotaping us! hmm... Harvey

From: KCStarguy@aol.com

Just before eclipse day in 2001, I met a couple with a bunch of their kids near Victoria Falls. They were going on a safari on the day of the eclipse somewhere and did not know about the eclipse. I told them about the eclipse coming and that it would be great for the kids to see a total eclipse and tried to convince them to change their safari plans on that day and see the eclipse and so the safari another day. They were not too enthused. I doubt they changed their plans but I did try.

It is part lack of education and lack of knowing what happens during an eclipse. I have shown my sound/ slide shows of the 1972, 1973, 79 eclipses and video for 1998, 99 and 2001 to thousands to help educational process with school children and adults but there still others out there who cannot appreciate nature's great spectacle. sighhhh (their loss).

One of my favorite pics that I resurrected from a slide by using a used Nikon coolscan slide scanner 1000, was the eclipse of 1979. As I remembered, I was totally astounded to see cars coming down the highway with their lights on (which I can see in the pic) but not stopping. Dr.Eric Flescher (kcstarguy@aol.com)

From: Klipsi

yep ! this reminds me of a bumpersticker line I created : I'M SMART - I HAVE A THREE-DIGIT EYE CUE ! ;-) Klipsi

**Status of eclipse filter ban in W. Australia (Bevan Harris)**

From: "Bevan Harris" <analemma@bigpond.com> To: <eclipse@hydra.carleton.ca> Date: Wed, 1 Jan 2003

Hello all, In case my mail headers haven't given the secret away, my name is Bevan Harris - resident of Perth, Western Australia.

I thought it was about time I turned up here, having both a total (Dec 4 2002) and an annular (Feb 16 1999) eclipse on my personal tally. Naturally I bow deeply to those supremos who have trekked to dozens of eclipses and will cry softly in my Weetbix when I realize that I will probably never attain such exalted privilege. I'll die trying though!

I've yet to see the full discussion on this list regarding the solar filter ban in Western Australia, but thought this would be an appropriate forum in which to gather expert opinion in my attempts to have some sense of logic prevail here. As you would probably be aware, the ban imposed here was of an interim nature (initially sufficient to address any "danger" associated with the eclipse) and was due to expire on Monday. With this in mind I e-mailed to Tony Minuta, the Principal Product Safety Officer at the WA Department of Consumer and Employment Protection (DOCEP), to obtain an update on the situation. His reply is appended below.

I have also been in correspondence with a number of WA gov-

**Something went wrong...**

From: Jean-Paul GODARD To: solARE-CLIPSES@AULA.COM Date: Wed, 01 Jan 2003 13:42:04

Sometimes clouds may participate to the solar-moon-observer-earth alignment... And the recipe miss.... But this is not a reason to forget the report, there is always something to tell...

My wife Martine (Kitchen's Goddess) and myself were "clouded out" at sea on the deck of the "Olympia Countess"... We made some pages about this sad experience which did not compromise the rest of our austral vacations.

<http://mapage.noos.fr/eclipses/>

My son Francois made a short report from Sydney (Australia) where he could catch a partial eclipse at sunset in the smoke of the bush fires.

[http://mseclipse.free.fr/021204/TSE021204/resultat\\_reussite/resultats\\_reussite\\_english.html](http://mseclipse.free.fr/021204/TSE021204/resultat_reussite/resultats_reussite_english.html) Cordialement, Martine & Jean-Paul

ernment ministers since the imposition of the ban. I think it significant to note that I did not receive a reply from the minister responsible for DOCEP until the day that the ban expired, in spite of the fact that I had sent the minister both a follow up letter and copied him on a submission to the Eclipse Filters Review Committee.

I'm in the process of placing my end of this saga on my website at <http://users.bigpond.com/bmh>, but have been delayed due to the festive season. My intention is to include transcripts of correspondence and whatever other relevant information I can obtain. I'm attempting to have the site sufficiently updated by 1600 UT on January 1.

Many thanks to those of you who have helped in this matter thus far. Regards, Bevan Harris

=== Tony Minuta's reply =====

Bevan Thanks for your enquiry. Also, I wish to acknowledge that I received your letter dated 20 December 2002 and I will ensure it is passed on to the Consumer Product Safety Committee (CPSC). I have only just returned from leave and have had to update myself on this issue.

The interim ban has expired and at this stage there has been no recommendation from the CPSC to extend this for a further 28-day period. As previously mentioned the matter has been referred to the CPSC to consider.

The CPSC met on 3 December 2002 and commenced its investigation immediately. Comments and advice is currently being sought from a range of experts. The CPSC is scheduled to meet again in February 2003 on a number of issues and I am sure that Solar Eclipse Glasses will be on the agenda for that meeting. I am not sure that there will be sufficient information at that stage for the CPSC to make a recommendation.

I have recently received an initial test report of the filters used in the solar eclipse glasses. As previously mentioned you will need to make a Freedom of Information request to obtain a copy of the report. As the matter is currently being investi-

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gated there may be some limitations on the amount of information you may be entitled to receive with an FOI application. I suggest that you contact the Department of consumer and Employment Protections FOI co-ordinator for advice on this matter. The officer's name is Peter Harding and he can be contacted on 08 9282 0499. Regards Tony Minuta

==== My e-mail to Tony =====

From: Bevan Harris [mailto:bmh@bigpond.com] Sent: Tuesday, 31 December 2002 0:37 To: tony minuta

Hello Tony, I note that the interim ban on the sale of solar viewing equipment was due to expire yesterday. Could you please update me on the status of the ban and the testing on the affected equipment? Regards, Bevan Harris

## ECLIPSE OVER SOUTH AFRICA

by Ernie Piini

Wanna make a million dollars and more? Design a gadget that that will filter away clouds at an eclipse and I'll mount it in front of my telescope, camera, and/or eye glasses; because once my heavy equipment is setup and aligned to the north/south pole I can't make a run for clearer skies or fly above the clouds. Sometimes clouds are impossible to avoid.

Such was the case at our site 50 km east of the city of Messina, Republic of South Africa. Our centerline coordinates were: Latitude 22 deg. 27 min. South; Longitude 30deg, 27.5 min. East, as measured by my Global Positioning System (GPS).

For this eclipse I joined Jen Winter's Astronomical Tours, a 27 person expedition of nine RVs caravanning around northern South Africa. Our RV was occupied by eclipse chasers Dr. Jacques Guertin from Newark, CA; Sandra Stewart from Berkeley, CA; and me. We learned how to drive on the wrong side of the road with no accidents!

We arrived at the selected site in the afternoon around 4 p.m. and aligned our RV's in a north-south orientation. This would give us a broadside view of the early morning eclipse.

After a delicious evening barbecue we sat outside our RV's and watched the clear skies with total enjoyment as they turned super dark, displaying those wonderful star-studded Southern skies. I've seen the Magellanic Cloud many times before but this had to be the best. There were no nearby cities or towns to pollute the skies. I gazed at this down-under experience in amazement for several hours before going to bed. It looked like the eclipse, just hours away, was a sure bet for a clear sky. Instead of sleeping I remained awake thinking of those tasks I still had to do to optimize my telescope and piggyback camcorder setup. A group several miles to the south played loud Cajun-like music till about 2 a.m., entertaining me since I was not sleeping.

Dr. Guertin and I rose at 4 a.m. and began our final equipment checks. Looking outside we were highly disturbed to see a cloud front, reported to be around 14,000 ft in elevation, moving in from the west. Later, more clouds crisscrossing at a much lower level made improbable our chance of seeing a clear eclipse.

At sunrise I found a few minutes of clear skies and focused my cameras without the solar filters, saving precious moments for totality. First contact was calculated for 7:12:01 a.m. From this moment on the view of the partials was only a teaser. We took a few photographs of the partials imbedded in the clouds. Totality began at 8:18:44 and lasted 1 minute and 24 seconds. We verified the timing of each contact with Dr. Guertin's audio recording. We were within one second of time! Realizing we would not see totality, I removed my Canon GL-1 camcorder from the telescope mount and recorded wide angle views of the moon's shadow and the colorful horizons. The roosters from a nearby farm were confused and crowing as 2nd contact neared.

Momentarily, we saw the corona backlighting the clouds. Another group, located near Messina, approximately 70 km to the west, saw the eclipse clearly through a break in the clouds-much like what I saw at the August 11, 1999 "Miracle Eclipse" near Munich, Germany.

I felt sorry for the disappointment of those observing a total solar eclipse for the first time. I have been fortunate to have seen many clear and remarkable eclipses in the past. I was hoping they would see their one. Don't be discouraged, there is always a next time, and the view is worth the effort.

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The meteorological facts I recorded included a 4 degree Fahrenheit drop in temperature from 6 a.m. to the end of totality, a 10 percent increase in humidity from 60 to 70 percent and, as I have witnessed at other eclipses, the wind ceased during totality.

For traveling halfway around the world to this eclipse, we were rewarded with a fascinating three day drive through Kruger National Park. We saw scores of wild animals and birds from the roadside. After four trips to Africa, I saw my first rhinos! We saw lions devouring their catch, and a river infested with crocodiles. One evening after a safari observed from an open-air bus, we were treated to another barbecue. After eating we hopped back onto the bus but it could not move uphill. Did we eat that much? We had to walk the last 1000 feet or so to the top, while under protection from the wildlife by rifle-totting guards.

We saw rugged mountain ranges and scenic views. The Mac Mac Falls were interesting but can't compare to Victoria Falls that I saw during my Zambia eclipse visit in 2001. On our pre-eclipse tour we toured Pilgrims Rest, a historic village which includes a small church moved up from Cape Town in the south. The church is now a 12-stool bar, its walls stocked with booze. An awesome view, God's Window, overlooks a colorful valley far below, extending as far as the eye can see.

I loved visiting South Africa and the Kruger National Park. I'd recommend a visit to this land to anyone. Happy holidays.

From: Cliff Turk

Hi Patrick & Joanne The long report of a non-event seems to me to be hardly necessary. The only things I found which really require comment are:

(1)"What on Earth is an RV?" To me an RV(military term) is a rendezvous, but this is clearly not your meaning.

(2)"On which side of the road do you drive in the UK?" Do I detect a reason for the UK's road accident rate?

Or is this an excuse for South Africa's accident rate increasing so suddenly in December? And which is the wrong side of the road anyway? Cliff Turk

From: Klipsi

Dear Cliff,

> Subject: Re: [SE] Eclipse over South Africa Hi Patrick & Joanne The long report of a non-event seems to me to be hardly necessary.

the report is from Ernie Piini

> > ECLIPSE OVER SOUTH AFRICA by Ernie Piini

Patrick and Joanne only forwarded this report to the SEML

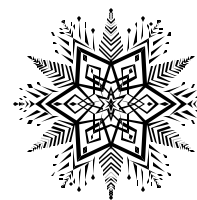
> The only things I found which really require comment are: (1)"What on Earth is an RV?"

RV , Recreational Vehicle. = campervan. Expression commonly used in the U.S.

> (2)"On which side of the road do you drive in the UK?" Do I detect a reason for the UK's road accident rate? Or is this an excuse for South Africa's accident rate increasing so suddenly in December? And which is the wrong side of the road anyway?

Pat and Joanne live in U.K. They drive on left side, just like in South Africa and Australia. But Ernie Piini lives, I believe, in the U.S. or Canada, where they drive on the right side (note : right, as opposed to left, not to wrong ;-)

oh, and if you're annoyed by reports such as the one Ernie wrote, I suggest you follow this link :



(Continued on page 49)

> To unsubscribe : send E-mail to [listserv@Aula.com](mailto:listserv@Aula.com), with in the body : unsubscribe solareclipses  
;-) no offense, amigo ! Klipsi

### Late report from Purple Downs

From: Timo Karhula To: [SOLARECLIPSES@AULA.COM](mailto:SOLARECLIPSES@AULA.COM) Date: Fri, 03 Jan 2003 11:39:12

Hello all, I took a long vacation to Australia and arrived back to Sweden just before Xmas. Here follows my eclipse report from Purple Downs, 30 kms south of Roxby Downs, South Australia. I have not yet had time to read other umbraphiles' reports in SEML, so I don't know if anybody else of you were there. /Timo Karhula

#### Eclipse in the Outback 2002

Already at the Zambia eclipse, I decided to view the next total solar eclipse in Australia on December 4th 2002. I had not yet planned how to travel from my father's home in Geraldton, Western Australia, who lives about 3000 km from the eclipse zone in Southern Australia. Only a week before my departure from Sweden, I got in touch with the noted comet observer, Andrew Pearce, from Perth. I asked him about his eclipse plans and it turned out that he was in want of a travel companion. We drove with his Subaru Liberty AWD through the vast Nullarbor plain. It is reputed to be the world's flattest, larger land area and is almost devoid of trees. Between the Balladonia and Caiguna service stations is the longest absolutely straight road in Australia (maybe in the world), 160 km, and is undulating only a few metres in height. The debris of the SkyLab space-station plunged down near Balladonia in 1979, and in the motel, there is a small museum devoted to the event. We camped in tents and observed the starry skies when clear weather prevailed. After three days of driving, we arrived to Ceduna, where the eclipse duration would be the longest and the sun at the highest altitude in all of Australia. According to the weather forecast, there would be scattered clouds in Ceduna, but totally clear in the inland. Thus, we decided to proceed our trip. Our alternative plan was in fact to continue additional 720 km to Roxby Downs (80 km north of Woomera), where some of Andrew's observing friends would assemble.

We reached to the site on the day before the eclipse. Here were the well-known comet- and variable star observers Michael Mattiazzo, Terry Lovejoy, and from the Netherlands, Reinder Bouma and George Comello. Tony Henderson was our host and here also arrived the president of the Astronomical Society of South Australia (ASSA), Steve Cook, and amateurs from Sydney. This night we drove outside the town to observe the dark southern sky with Michael's NexStar 11 inch GPS telescope. We had organized so that we would meet the JPL scientist Charles Morris, and his wife, Carmelita Miranda. I have sent sporadic comet observations to him the past seven years, so it was great to meet him here, in the middle of nowhere! We were maybe the first to visually see the remote comet C/2001 Q4 (NEAT), whose perihelion is not until May 2004.

There was not a trace of a cloud in the sky for two days. The E-day was nothing but a long wait. The eclipse would take place as late as 7:41 pm. Our friends went out in good time to reserve favourable viewing spots by the road near Purple Downs, 30 km to the south. When arriving to our eclipse site, there were already hundreds of spectators gathered on both sides of the road. The authorities had lowered the maximum speed from 110 km/h to only 60 km/h this afternoon due to the eclipse. I had planned to record the event with my Sony CCD-TRV65E video-camera, as I had done during four central eclipses before. I used an Astro Baader solar filter in front of the objective. Unfortunately, there was a strong wind that somewhat disturbed my recordings. I chose the highest spot on a low hill, so that nobody would run in front of me during the precious moments. According to my GPS navigator, my coordinates were: latitude = -30d 48'52".2, longitude = +136d 54'14".4, elevation = 120 metres and I was situated 1270 metres from the exact central line. Michael had brought his 25x100 Oberwerk binoculars equipped with solar filters. I wore my eclipse T-shirt from Zambia and therefore many people came and chatted with me. Here was also a Finnish pair with whom I spoke in my native language. A couple of seconds after the 1st contact, the dark silhouette of the moon could already be seen on the sun's limb. I had placed a digital thermometer on the sandy ground, in the shade of a bush and it was initially a pleasant +26.3 C. Tony had brought an exclusive 4-inch Takahashi refractor, which everyone could look through. Beneath us, there was a big ASSA-poster, which apparently collected lots of people.

The totality would happen an hour later. Two minutes prior to totality, I started to videotape the thinning solar crescent. The temperature had dropped slightly to +23 degrees C. The light was strange, as if there were some filth in our eyes. 45 seconds before totality, a pair of doves were terrified by the sudden increase of darkness. Ten seconds before 2nd con-

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tact, I removed the solar filter and caught a fantastic sight with 18x of optical magnification. A long row of Baily's beads and a pink chromosphere formed the sun's upper, right part. This 'welding arc' disappeared slowly behind the moon. Five prominences were visible in the opposite side of the moon's limb. The largest prominence was situated toward the direction "half past 7". The smaller ones were at "half past 3", "6 o'clock", "8 o'clock" and "quarter to 9". The faintest part of the corona was at "9 o'clock" (due left). The shadow of the moon was racing toward us with a speed of 30 000 km/h like a huge, gray wall in the sky. Totality! The crowd was cheering and screaming. Now, I was in a big hurry. Zoom in, zoom out, change exposure times in order to capture as much details as possible, from the bright inner corona to the faint outer corona. With the longest exposure time, the corona reached out to about 1.5 solar diameters and the surrounding sky turned to a deep-blue colour. A quick glance around, to see the 360-degree twilight around the horizon. Could Mercury and Antares be found? An observation with hand-held 8x20-binoculars. No, they were not seen with a swift look. Another diamond ring emerged which meant that a mere 28.5 second totality was over (27.6 seconds when taking the limb corrections into account). Put on the filter again. What a show!

This was definitely the most fleeting half-minute that I had experienced. Andrew admitted what others claim, that a total solar eclipse is the grandest astronomical phenomenon one can witness. He had been clouded out twice on earlier eclipses. This was George's tenth total eclipse but he failed to photograph this one because of a jamming camera just a few minutes before totality! My fourth total was especially pretty, being only five degrees over the horizon. On my tape, a black sun is hanging majestically over the landscape. Due to the short duration, this was my most challenging video-recording.

Half an hour later the sun would set. I had not before filmed the setting sun while in eclipse. It was great to see the moon dividing the sun into two parts while dropping behind the flat skyline. The left part of the sun was larger and the limb was distorted due to refraction. One or two seconds before the upper horn's disappearance, I managed to document a green flash! The last rays of the sun turned into a greenish hue on the LCD-screen (using no filters, of course).

This night we celebrated the successful event and we watched my recordings. It was time to leave the following morning, and we drove back to Perth in three days. Altogether, I drove 5800 km from Geraldton and back and probably I made the longest drive of all in Australia in order to see the "Eclipse in the Outback". Next, Turkey on 29th of March 2006? /Timo Karhula

### Shadow Bands

From: Geert Vandenbulcke

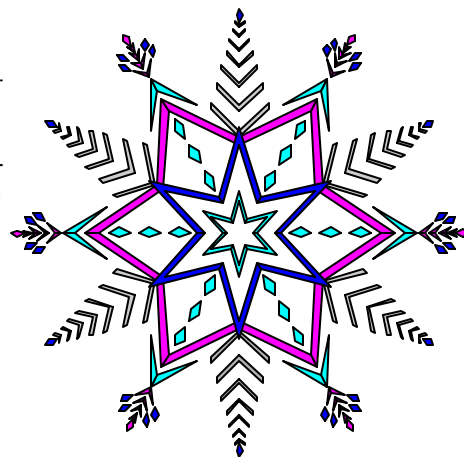
Hello, A friend of mine (Roland Gadeyne, he's not on internet/email) travelled to Australia and saw shadow bands very clearly before and after totality. It was his 5th eclipse but first observation of the phenomenon. Best regards, Geert Vandenbulcke

## ASE 2003

### "Biblical Sense"

From: Discipletrade@aol.com Date: Fri, 27 Dec 2002 To: eclipse@hydra.carleton.ca

Please instruct me on how to receive info on Vol 1#285...I am [simply] with Pathways Foundation. To be redundant, our Simple Foundation is interested only in the "Biblical Sense" of any upcoming 'eclipses' for year 2003. discipletrade Carol



**31 May, 2003 - Any plans?**

From: Harvey Wasserman To: SOLARECLIPSES@AULA.COM Date: Tue, 24 Dec 2002 16:59:44

After reading through the NASA buletin - thank you Fred! - I find myself becoming more interested in this eclipse. What plans are being made? It looks like my best bet will be Iceland, travelling from the US. Anybody else thinking of that? Harvey Wasserman

From: Govert Schilling

I'm planning to make a brief trip to Northern Scotland. Chances of good weather are poor everywhere, and Scotland is very cheap to fly to with EasyJet from Amsterdam. --Govert, who has never seen an annular eclipse before <http://www.govertschilling.nl>

From: Raymond Badgerow

This post is in response to Harvey's question. I just finished doing a google search, and found quite a few options for chasers to choose from. Here are the url's that I have discovered: [http://www.betchartexpeditions.com/europe\\_icld.htm](http://www.betchartexpeditions.com/europe_icld.htm)

<http://www.icelandtravel.is/Internet/Innanwebguard.nsf/key2/annulareclipse>

<http://www.spearstravel.com/Iceland03.htm>  
<http://www.tq-international.com/Greenland/Greenland.htm>  
<http://www.eclipsetours.com/iceland.html>  
<http://www.cloctower.demon.co.uk/eclipse2003/websites.htm>  
<http://extranet.co.uk/content.asp>  
<http://www.cali.co.uk/freeway/gillyflowers/eclipse.htm>  
<http://www.flycapers.com/tours/voyages/2003/2003Iceland>  
[http://www.vjv.com/tours/scientific/Iceland\\_eclipse\\_main.html](http://www.vjv.com/tours/scientific/Iceland_eclipse_main.html)  
<http://www.host.co.uk>  
<http://www.dunnethead.co.uk>  
<http://www.expeditiontrips.com/search/trip.asp?tripid=1097>  
<http://www.expeditiontrips.com/search/trip.asp?tripid=961>  
<http://www.naturalist.co.uk/tours2003/janmayen.html>  
<http://www.naturalist.co.uk/tours2003/scottishislands.html>



<http://www.5stars-of-scandinavia.com/scottish/faroeislands.htm>  
<http://www.focusonnature.com/RecentE-MailBulletins.htm>  
<http://www.astrosociety.org/events/tours.html>  
<http://www.skyscapes.com/TravelOps/Upcoming.htm> (I have the itinerary).

I hope this suits Harvey, there is plenty to choose from. Have a Merry Christmas and a Happy ,Clear New Year. Ray Badgerow

From: Klipsi

Harvey, wanna see the eclipse from air , on a normal scheduled flight ? Meet me on NW34 / KLM6034 "North by Northwest" Seattle nonstop to Amsterdam, see the eclipse from air if all goes well. see <http://eclipse.span.ch/2003ase.htm> for details. Leave May 30, arrive May 31, see eclipse 2 hours before landing, when aircraft is between Iceland and Scotland. Seats row A or B.

a flight to Europe in late May can also be used by some folks to go on site inspection for the June 8 2004 Venus transit, a year ahead of event. Klipsi

From: Raymond Badgerow

Harvey, you should my own thread on May 31 expeditions .There are a number of options for you to choose from. Ray

(Continued on page 52)

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From: Harvey Wasserman

Raymond - Thanks for posting that list. There were a couple of sites that didn't show up in my search.

Klipsi - Yes, I looked at that flight after your first posting. This sounds like a plan with excellent prospects, but I would need to get back and forth from Florida to Seattle to make it happen - just not in the budget, unfortunately.

I love that this eclipse happens on the "far" side of the earth, if you will. How rare is that?

Govert and I hope to see our first annular. I think he might have the less expensive expedition, though. Good luck Govert! Harvey Wasserman

From: Harvey Wasserman

Raymond - Thanks for posting that list. There were a couple of sites that didn't show up in my search.

Klipsi - Yes, I looked at that flight after your first posting. This sounds like a plan with excellent prospects, but I would need to get back and forth from Florida to Seattle to make it happen - just not in the budget, unfortunately.

I love that this eclipse happens on the "far" side of the earth, if you will. How rare is that?

Govert and I hope to see our first annular.

From: Raymond Badgerow

Harvey- your welcome, I hope you choose something suitable. I'm considering Iceland myself.

From: Sheridan Williams

Don't forget that I have a web site with details of the annular in Scotland: [www.clock-tower.com/eclipse2003](http://www.clock-tower.com/eclipse2003) Best wishes Sheridan Williams

From: Wil Carton

What about Thorshavn, on the Far Oer Islands? Has Jay Anderson please meteorological statistics for that city? The altitude of the eclipsed sun will be higher there than in Scotland and than on Iceland. Wil Carton.

From: Michael Gill

Wil, Yes he does have some statistics for that location. Check out the following URL:

<http://home.cc.umanitoba.ca/~jander/ann2003/table1.html> Michael Gill

From: Sheridan Williams

Don't forget, if you want to see the Sun rise out of the sea at azimuth 40 - 43 degrees you will have to be on the north east coast of Iceland diametrically opposite Reykjavik. Best wishes Sheridan

From: Sheridan Williams

The advantage of Thorshavn is that you can check it out ready for the totality on 20 March 2015. The altitude will not be higher than in parts of Iceland. Also bear in mind that a ring of fire will be prettier close to the horizon. (Provided it is clear of course). Best wishes Sheridan

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## NASA TP 2002-211618 -- Annular and Total Solar Eclipses of 2003

From: Fred Espenak To: SOLARECLIPSES@AULA.COM Date: Fri, 13 Dec 2002 18:51:48

NASA TP 2002-211618 -- Annular and Total Solar Eclipse

New NASA Bulletin for Annular and Total Solar Eclipses of 2003

On 2003 May 31, an annular eclipse of the Sun will be visible from a large zone covering the North Atlantic. The path of the Moon's antumbral shadow begins in northern Scotland, crosses Iceland and central Greenland, and ends at sunrise in Baffin Bay (Canada). A partial eclipse will be seen within the much broader path of the Moon's penumbral shadow, which includes most of Europe, the Middle East, central and northern Asia, and northwestern North America.

Six months later on 2003 November 23, a total eclipse of the Sun will be visible from a broad corridor that traverses portions of the Southern Hemisphere. The path of the Moon's umbral shadow begins in the Indian Ocean, crosses Antarctica, and ends at sunrise near the edge of the southern continent. A partial eclipse will be seen within the much larger path of the Moon's penumbral shadow, which includes Australia, New Zealand, Antarctica and southern South America.

A new NASA solar eclipse bulletin covering these events is now available. "Annular and Total Solar Eclipses of 2003" (NASA TP 2002-211618) is a 75 page publication containing detailed predictions and includes besselian elements, geographic coordinates of the annular and total paths, physical ephemeris of the umbra, topocentric limb profile corrections, local circumstances for hundreds of cities, maps of the eclipse paths, weather prospects, the lunar limb profiles and the sky during totality. Tips and suggestions are also given on how to safely view and photograph eclipses. NASA's eclipse bulletins are prepared in cooperation with the IAU's Working Group on Eclipses and are provided as a public service to both the professional and lay communities, including educators and the media.

Single copies of the bulletin are available at no cost and may be ordered by sending a 9 x 12 inch SASE (self addressed stamped envelope) with sufficient postage (12 oz. or 340 g). Use stamps only; cash or checks cannot be accepted. Requests within the U. S. may use the Postal Service's Priority Mail for \$3.95. Please print either the eclipse date (year) or the NASA RP number in the lower left corner of the SASE. Requests from outside the U. S. and Canada may send ten international postal coupons to cover postage. Exceptions to the postage requirements will be made for international requests where political or economic restraints prevent the transfer of funds to other countries. Professional researchers and scientists may order the bulletins directly (no SASE is necessary).

An order form for this publication can be found on the web at: <http://sunearth.gsfc.nasa.gov/eclipse/SEpubs/RPrequest.html>

Other eclipse bulletins currently available are:

"Total Solar Eclipse of 1995 October 24" (NASA RP 1344)  
 "Total Solar Eclipse of 1997 March 9" (NASA RP 1369)  
 "Total Solar Eclipse of 1998 February 26" (NASA RP 1383)  
 "Total Solar Eclipse of 1999 August 11" (NASA RP 1383)  
 "Total Solar Eclipse of 2001 June 21" (NASA TP 1999-209484)  
 "Total Solar Eclipse of 2002 December 04" (NASA TP 20021-209990)

The NASA eclipse bulletins are also available over the Internet at:

<http://umbra.nascom.nasa.gov/eclipse/>

The entire document TP 2002-211618 "Annular and Total Solar Eclipses of 2003" will be available on-line in early 2003 at: <http://umbra.nascom.nasa.gov/eclipse/2003/rp.html>

There are also two special web sites with additional 2003 eclipse information and maps at:



(Continued on page 54)

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<http://sunearth.gsfc.nasa.gov/eclipse/ASE2003/ASE2003.html>

<http://sunearth.gsfc.nasa.gov/eclipse/TSE2003/TSE2003.html>

These web sites will be expanded in the coming months.

For more details, contact Espenak.

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[jander@cc.umanitoba.ca](mailto:jander@cc.umanitoba.ca)

From: Gessner <[gessner@easynet.fr](mailto:gessner@easynet.fr)>

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Why will this Moon-shadow travel East-West while the other eclipses I remember went West-East? Thanks anyone for any explanation Nicolas Gessner [gessner@easynet.fr](mailto:gessner@easynet.fr)

From: Gessner <[gessner@easynet.fr](mailto:gessner@easynet.fr)>

> Due to the antumbral shadow at the May 31st 2003 annular eclipse falling onto high terrestrial latitudes and Earth's Northern Hemisphere leaning towards the Sun, the Moon's shadow axis passes between the Pole and the day/night terminator.

>

> This means that the antumbra moves in the 'wrong' direction across the Earth's surface at this eclipse. Michael Gill

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> because it happens "over the shoulder" . In daytime over Asia, at night over the Atlantic and > USA, but in high arctic zone you get the midnight Sun, and the eclipse , too. klipsi

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Thank you, Michael & Klipsi, for helping me understand this: The Moon-shadow always comes from the right and moves to the left -- for 'usual' northern-hemisphere, mid-latitude eclipses, this means: from West to East. However, for this next arctic eclipse of the 'midnight-sun', looking North, this means: East to West. Nicolas [gessner@easynet.fr](mailto:gessner@easynet.fr)





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3**Beauty Eclipse--How do we work with unstable platforms?**

From: klipsi@bluewin.ch To: SOLARECLIPSES@AULA.COM Date: Thu, 12 Dec 2002 02:18:46

>In 2003 and 2005, we will have to deal with unstable platforms like aircraft and ships. How do we get to produce usable results: images, measurements, spectra, under such conditions? Most of us have been landlubbers on eclipse expeditions.

of course, images of the eclipse will not match the quality of, say, the 1991 TSE.

But fast finegrain film, and cameras with image stabilization, are part of the answer.

from aircraft, observing can be relatively stable, if there is no turbulence right then and there.

from icebreaker, trapped in packice, I believe it will be relatively stable. No huge waves in packice.

another expedition will observe it from Antarctica mainland, stable.

And, the Antarctica eclipse cruise/expedition is a once-in-a-lifetime event. With or without clouds on e-day. The eclipse on that trip is like the cherry on a pie. Maybe we won't have a cherry. But we will have the pie. Klipsi

**TSE 2002 CROYDON FLIGHT: Meetings/Discussions with Phil Asker & QA Pilots**

From: Glenn Schneider To: SOLARECLIPSES@AULA.COM Date: Thu, 12 Dec 2002 05:45:56

Ref: [http://nicmosis.as.arizona.edu:8000/ECLIPSE\\_WEB/ECLIPSE\\_03/CROYDON\\_ECLIPSE.html](http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_03/CROYDON_ECLIPSE.html)

On Saturday, 8 December 2002, after arriving in Melbourne, Australia, I had a very positive and productive meeting with Phil Asker of Croydon travel (with Joel Moskowitz in attendance) regarding the now-solicited Antarctic "sightseeing/eclipse" flight using a QANTAS B747-400. Many on SEML (and also many who have already signed up for this flight) have expressed concerns regarding the conduction of that flight as being suitable for principle needs of eclipse observers. Our meeting was in part a conduit for discussion of those concerns, and as such was a significant consciousness raiser regarding them. All items and issues which we enumerated and detailed well received and, as a result many questionable or previously open issues were evaluated and addressed.

Phil was very receptive to our ideas. This meeting convinced me that he is both committed and dedicated to do whatever is necessary - within the bounds of feasibility for the B747-400 operations - to assure a successful airborne eclipse observation to everyone's satisfaction.

I have now had preliminary discussions with a very enthusiastic QANTAS Cpt. John Dennis who will be piloting the flight, and I will be working with both him and Cpt. Peter Edger to define the flight details and work out the navigation interface procedures and protocols. To facilitate that, and to better my understanding of the 747-400 operations, on 10 December 2002 I met with the very helpful QA B747-400 pilot Cpt. John Black. He introduced me to some flight operations procedures and interfaces of the QANTAS 747-400 and familiarized me with the flight deck, and navigation system. Then, and later (as I flew home from Melbourne from TSE 2002 on the aircraft he was piloting) we discussed variety of issues germane to defining and implementing a successful eclipse flight. I must also add that Cpt. John Dennis is quite keen on this, and we will be working cooperatively toward that end in flight planning. Indeed, it is a virtual certainty that if, as it now seems, this continues to evolve in a positive way, that I will be on the flight deck prior to, and during the eclipse, defining and assisting with in-flight navigation corrections as needed.

Many operational details will be iterated and solidified over the next few months with continuing dialogs with the cognizant QANTAS flight operations people and with Phil Asker to assure coordination of eclipse observations and Antarctic siteseeing. In early March I will be meeting with Cpt. John Dennis in Los Angeles to further discuss and review many details of the flight plan which will evolve before that time.

I wanted to take a few moments to summarize some of the major "changes" in thinking about this flight concept, which Phil Asker has and will work toward integrating into his offering for this flight. He will be preparing an updated direct mailing to detail the implementation, which likely would include a repricing, but ahead of that here are the major elements.

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Most importantly, eclipse observing will take place AFTER the Antarctic sightseeing portion of the flight - not interleaved between sightseeing periods. This has many advantages. First, by planning the eclipse run at the end of the Antarctic portion of the flight it buys us a time buffer of appx. 4 hours if the flight is delayed on take-off for any unforeseen reason (by then of necessity observing the eclipse first). Assuming such a contingency does not arise this means we will be able to observe the eclipse from a higher altitude (less air to look through, and lowering the chance of cloud above the flight level and along the line-of-sight) as the aircraft will be lighter after burning off additional fuel. (On take-off the aircraft will be flying with full tanks, appx. 185,000 gallons). Executing the eclipse run after the sightseeing portion of the eclipse reduced the number of "seat rotations" and puts the flight into an eclipse- dedicated phase. This is far more preferable than interleaving the eclipse with sightseeing with non-eclipse passengers "rotating" to the windows on either side of the eclipse. Hence, the flight will be conducted in two parts, a longer sightseeing part, and a shorter, dedicated, eclipse viewing part, with eclipse chasers then occupying the sunside window seats.

The Antarctic sightseeing will be conducted at low flight level, appx. 8,000 to 10,000 ft. Upon its completion non-eclipse observers will vacate the sunside window seats as the aircraft ascends to eclipse- viewing level (appx. 11-12km, at a rate of about 2,000 feet per minute) and is repositioned to the start of the "totality run"). The details of that ascent and repositioning depends upon TBD details of the sightseeing portion of the flight, but would be about 370 nM if the aircraft is over the Casey region (shorter if closer to the centerline of the eclipse path) for a 22:40UT mid-eclipse intercept (other possible intercepts will be discussed separately).

Phil had originally envisioned the eclipse observing period to be significantly longer than is necessary, and that had biased his initial considerations of the flight concept and concomitant seat rotations. Indeed, once at flight altitude at the "pre-totality" near intercept point, the aircraft need make a final heading realignment maneuver only about eight minutes before mid-eclipse - providing time to acquire and focus cameras, etc., on the crescent Sun. This permits the allocation of eclipse-only dedicated seats for those primarily interested in the eclipse, with more time earlier in the flight for sightseeing by rotating non-eclipse viewers. Eclipse watchers who also want to be part of the sightseeing rotation would be able to do, likely paying a different rate than "eclipse only" or "sightseeing only" passengers. Phil Asker is rethinking the costing on these bases and will likely have an update about those options.

I have confirmed that with this aircraft it is indeed not possible to remove the sunside seats - not because of hardware constraints, but because of scheduling constraints. The same aircraft will be in use again only hours after the completion of the eclipse flight and there would be insufficient time for ground reconfiguration.

As a closing note (for now) it is very likely that I will work very closely with the flight crew (in the cockpit) to effect in situ changes to the intercept as needed. Such flexibility is a built-in precursor to the definition of flight operations. I have put some brief notes on flight concepts in development on my web server at:

[http://nicmosis.as.arizona.edu:8000/ECLIPSE\\_WEB/ECLIPSE\\_03/CROYDON\\_ECLIPSE.html](http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_03/CROYDON_ECLIPSE.html)

Having just returned from TSE 2002 I have a huge amount of non- eclipse related work to catch up on, so pardon any delay in replies. Glenn Schneider <http://nicmosis.as.arizona.edu>

From: Glenn Schneider

The error in the subject line is due to jet-lag from just having returned from Melbourne. That is rather obvious, but I wanted to circumvent a lot of unnecessary emails pointing that out.



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3**2003 Sunrise - was - Sunset eclipse in Queensland**

From: Glenn Schneider To: SOLARECLIPSES@AULA.COM at: Wed, 18 Dec 2002 18:07:18

ccmlt wrote: Are you considering the next TSE for that {TRUE sunset eclipse} ?

No, the chance of seeing the 2003 TSE on the horizon in circum-Antarctic waters is pretty small. I suppose it might be possible where the eclipse-at-sunrise line touches the coast near Maitri (Indian station at Lat -77.77S, Lon 11.73) or Novolazarev - but the weather there (not to mention the cost and logistical complexity really has me scared), and winds tend to run at appx. 40 km/hr. Plus having to look back toward the inland.

There is an operational (but not sure if currently operating) digital broadband seismograph, and an automated weather station, at Maitri. I don't THINK there is a camera down there - but it certainly is worth an inquiry. I have had no prior contacts at all with the Indian Antarctic program, or anyone involved with it, but I have sent the following inquiry to Jaya Naithani, who has extensive experience with the conditions at Maitri:

Dear Dr. Naithani, I am contacting you because of your extensive experience with the climatological conditions at Maitri, Antarctica, and hopefully with the current state of the infrastructure (and logistics) at the facility. I am the project scientist for the Near Infrared Camera and Multi-Object Spectrometer on the Hubble Space Telescope. Next year I will be conducting airborne observations of the 23 November 2003 total solar eclipse [1] from over the Antarctic [2] (near Mirny). Mirny, and Maitri are actually in the path of totality, and Maitri (though a bit of centerline) is also at the point of sunrise. This could provide a unique opportunity for observations, either remotely or by in situ observers. Though I worked at the Amundsen-Scott South Pole station during two seasons, I have no familiarity with the Maitri facility. I presume it is currently operational (?) as daily weather reports are available, and I note the existence of a broadband seismometer. Might you be able to provide me with additional information, or an appropriate contact? Is the station accessible to US researcher(s), possibly through an NSF/Polar Programs liaison? If a dedicated team could not be deployed for this purpose would remote (i.e., service) observations be considered by station personnel (if there are any this season?) Any information would be most welcome.

[1] <http://sunearth.gsfc.nasa.gov/eclipse/TSE2003/TSE2003gif/TSE2003-3a.GIF>

[2] [http://nicmosis.as.arizona.edu:8000/ECLIPSE\\_WEB/ECLIPSE\\_03/CROYDON\\_ECLIPSE.html](http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/ECLIPSE_03/CROYDON_ECLIPSE.html)

Sincerely, Dr. Glenn Schneider, Ph. D. NICMOS Project Instrument Scientist <http://nicmosis.as.arizona.edu:8000/>

I will also make a more formal inquiry with NSF/Polar Programs, but not sure if they have a liaison with the Indian polar program. I will appraise SEML of any reply - positive or negative. Glenn Schneider

**2003 - YOUR chance for fame !**

From: Klipsi To: SOLARECLIPSES@AULA.COM Date: Thu, 19 Dec 2002 20:16:21

2003 - YOUR chance for fame ! See all 4 eclipses of 2003 from an aircraft , and you make history ! how ?

- 2 total lunar eclipses. May 15/16, and Nov. 8/9. Easy. Find any flight at night within the wide area of visibility, with low Moon, get a window seat on correct side. Just hope for no major flight delay, and no high clouds.

- total solar eclipse nov. 23, fly either Qantas charter with Croydon travel [www.antarcticaflights.com.au](http://www.antarcticaflights.com.au) , almost certain to see it , or book a window seat on right side of Qantas QF64 November 23 Johannesburg to Sydney (not certain to see it, route depending on jetstream position, timing subject to delays, but worth a try.)

- and for the annular solar eclipse of May 31, in Greenland, Iceland, Scotland ? piece of cake ! fly Northwest Airlines 34 / KLM 6034, Seattle May. 30 nonstop to Amsterdam May 31. read <http://eclipse.span.ch/2003ase.htm> this flight goes over Greenland, Iceland, Scotland. It arrives in Amsterdam 2 hours after the eclipse. Thus, it is between Scotland and Iceland 2 hours earlier, when the eclipse occurs there ! wonderful coincidence ! of course , it is not guaranteed to see the eclipse. Clouds, delays, flight

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The next total Solar Eclipse occurs around Mirny in Droning Maud Land in Antarctica at 0638 (local time) 24 November 2003. Croydon Travel, operator of Antarctica sightseeing flights since 1994, have chartered a Qantas Boeing 747-400 to operate a special Eclipse flight from Perth to provide an airborne platform to experience what promises to be one of the world's most spectacular and remote Eclipses.

## Flight Details

The flight will leave from Sydney on Sunday 23 November at 1900 and from Perth at 2300 (local times) on Sunday 23 November 2003 and return to Perth at approximately 1200 and Sydney at 2030 on Monday 24 November 2003.

We will fly south to the Antarctica Continent flying first over the Australian base at Casey and viewing the spectacular Antarctic coastal and mountain scenery around the Law Dome and the Bunge Hills. We have allowed about 2 hours for Antarctica sightseeing before the time of the Solar Eclipse to ensure that we have some time available in case of delays in departure time from Perth or Sydney. We also have 2½ hours on the ground in Perth to ensure an on time departure.

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We will follow the Eclipse south for the maximum possible time. On the ground the Total Eclipse will last 1 minute 55 seconds. By following the Total Eclipse at 11,000m we expect to extend this time to 2 minutes 25 seconds or more. The flight will return to Perth arriving at 1200 on Monday 24 November and continuing to Sydney arriving at 2030.

## Viewing Conditions

We have been operating Antarctica flights regularly since 1994 with 64 flights carrying over 22,000 passengers. We are working closely with Qantas Captain John Dennis, who is in charge of the Antarctica flight program and with Eclipse Chasers who have been involved with previous airborne intercepts of Solar Eclipses to ensure the absolute maximum viewing conditions of the Solar Eclipse over Antarctica. The aircraft will be positioned so that Eclipse Chasers will gain the maximum possible exposure to the Total Eclipse.

Our experience after 64 Antarctica flights indicates that cloud above 10,000m is very rare in the region in summer. Our experience also shows that we have not been required to use seat belts over Antarctica and have enjoyed virtually perfect flying conditions as the Katabatic winds blow only at very low altitude and we will fly well above any wind systems in the area. We have the ability to climb above any expected cloud systems to give the best opportunities for viewing the Eclipse.

## Seating Options

We offer Eclipse Chasers the exclusive use of all seats between the window and the left aisle of the aircraft (the Eclipse will be on the left side). The seats in the centre of the aircraft and on the right side will be sold to Antarctica sightseers and the flight will include spectacular Antarctica sightseeing before the Eclipse. This enables us to offer window seats to Eclipse Chasers at reasonable prices. If the flight was not subsidised by carrying normal Antarctica sightseeing passengers, the cost would be at least USD8,000 per person for all Eclipse side window seats.

For details of our Antarctica flights please see ñ

HYPERLINK <http://www.antarcticaflights.com.au>      [www.antarcticaflights.com.au](http://www.antarcticaflights.com.au)

You will notice that we offer six different seating options (note that prices ex Perth will be AUD200 higher than those shown for normal flights ex Sydney/Melbourne.)

During the flight the Eclipse side seats will be cordoned off from Antarctica sightseers and additional cordons will be placed around the seats in the period leading up to, during and immediately after the Eclipse to ensure that Eclipse Chasers are not impeded in their photography or activities.

## Eclipse First Class

In First Class on Qantas there are 4 window seats on the left side of the aircraft. In addition 3 persons seated in the aisle seat are able to sit on a guest seat facing the opposite direction at the window during the time of the Eclipse and the viewing time over

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Antarctica. Each of these 7 First Class passengers will have two windows available for viewing during the time over Antarctica and during the Eclipse. The person who travels southbound in the window seat will travel northbound in the aisle seat and vice versa.

In row 4 the passenger will retain the window seat for the entire journey as this seat is slightly removed from the actual window, but offers excellent viewing. This makes 7 absolutely premium Eclipse First Class seats available for Eclipse Chasers. The cost is USD6,000 per person.

#### Eclipse Business Class

In Business Class there are 7 Eclipse window seats in the upper deck and 6 Eclipse window seats on the lower deck. You retain the same seat throughout the flight. These seats, which have at least two windows and ample leg room are available at USD5,500. In addition there are 13 seats adjacent to the window seat available at USD2,200. These seats do not rotate to the window seat but at least two windows are shared between the two passengers on the Eclipse side.

In addition there are two window seats with slightly restricted viewing available at a cost of USD5,000 per person. (Seats 16A & 30A) The seat adjacent to these window seats is USD1,600.

#### Eclipse Business Class Complete Row

To ensure maximum space and privacy you can book the two Business Class seats for your sole use at USD7,000 or USD6,300 (restricted view ñ Seat 16A/B & 30A/B).

#### Eclipse Premium Economy Class

Premium Economy Class seats are in the rear cabin of the aircraft, well clear of the wing for excellent upward and downward viewing. Rows 58-69 have 3 seats between the window and the aisle while seats 70-73 have 2 seats between the window and the aisle. The rows will be cordoned off from other passengers for your exclusive use.

Passengers booking these seats will retain the same seat throughout the flight. Of course you are free to get up and move around the aircraft during the flight. The window seat offers a complete window for viewing and photography at a cost of USD4,000. The seat adjacent to the window seat costs USD1,200 and the aisle seat in the same row is USD800. Eclipse enthusiasts wishing to bring a partner or friend may purchase these seats at the reduced cost.

#### Eclipse Premium Economy Class Complete Row

You can purchase a complete row of 3 seats for your exclusive use at USD5,500 or of 2 seats (row 70-73) at USD5,200. This will give you ample space for your equipment.

#### Eclipse Standard Economy Class

These seats are located in the front two Economy Class cabins ñ row 39 in the front cabin and rows 47-55 in the second cabin. The seats are located near or over the wing with restricted downward viewing but excellent upward viewing. All seats in this category have a complete window available for your use and photography. These rows will be cordoned off for your exclusive use. You will note that several rows in the front two cabins are not included in this category ñ rows 40, 41, 46 & 56 have improperly positioned windows and are sold to normal Antarctica passengers at our lowest price of USD605.

The Eclipse Standard Economy window seats are USD3,500. The seat adjacent to the window seat is USD820 and the aisle seat same row USD650.

#### Eclipse Standard Economy Class Complete Row

You can purchase the complete row of 3 seats for your exclusive use for USD4,500. If you do so, you can keep it for your own use or additional space and for your equipment or if preferred, bring a partner or friend with you at no additional cost. Please notify us if you wish to bring a partner or friend.

The remaining seats in the middle of the aircraft and on the right side will be sold to Antarctica sightseeing passengers at our nor-

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mal Antarctica prices plus AUD200. However, these passengers will not have access to the Eclipse viewing area during the time leading up, during and shortly after the Eclipse. They will however subsidise the cost for Eclipse enthusiasts.

#### On Board Service

Full international meal and bar service will be provided including supper on the way south, snacks and icecream over the ice and a celebratory brunch on the return trip. Complimentary bar service is provided throughout the flight. During the Antarctica viewing, Antarctica experts will talk about aspects of life, science and history in Antarctica and an astronomer will provide details of the Eclipse.

A camera mounted on the flight deck will show take off and landing, the view of Antarctica and of the Eclipse on screens throughout the aircraft.

#### About Croydon Travel

Croydon Travel is a licensed travel agent and tour operator founded in 1971 by the Asker family. It is licensed and fully bonded by the Victorian Travel Agents Licensing Authority and your funds are protected by the Australian Travel Compensation Fund. Croydon Travel has always specialised in travel to remote and exotic destinations and was the first Australian tour operator to run tours to China, Bhutan, Seychelles, Cuba and Vietnam.

We commenced operating Antarctica sightseeing flights in 1994 and have operated 64 flights carrying over 22,000 passengers aboard Qantas 747-400 aircraft. In addition we operate a prestigious tour program ñ The Captainís Choice Tour utilising chartered aircraft, trains and ships to remote and exotic destinations around the world. We recently joined the Australian Pacific Touring group, one of Australiaís leading tour operators and have earned a fine reputation in the Australian travel industry. We have won numerous awards including the Victorian Environmental Tourism Award, Best Metropolitan Travel Agency Award and the Australian Federation of Travel Agents Perpetual Award for Services to the Travel Industry. Our founder Phil Asker, is still Managing Director of the company and is dedicated to ensuring a truly spectacular Eclipse flight.

#### A MOST ECONOMICAL COMPLETE ROW PRICE

This means that you can purchase the complete row of two seats in Eclipse Business Class or in the last four rows of the aircraft in Eclipse Premium Economy Class or three seats in Eclipse Premium or Eclipse Standard Economy Class. This means that you would have a complete row of seats for your own use and these seats would be cordoned off from other passengers so that they would not interfere with your photography and equipment. Of course you are free to bring friends to occupy these seats if desired, provided we are notified. All Eclipse Chasers seats will be located on the left (Eclipse side) of the aircraft and if you have booked a window seat, you will not need to rotate from the seat to another seat ñ it will be your seat for the entire flight both over Antarctica and during the Eclipse and the flight to and from Antarctica.

The seats in the centre of the aircraft and on the right hand (non Eclipse side) will be sold to Antarctica sightseers at lower prices, but they will not have access to any seats on the left hand side of the aircraft which will be cordoned off with several strips of cordon tape during the period leading up to, during and shortly after the Eclipse. This way Eclipse Chasers will be able to observe the Eclipse unimpeded and have ample room for their equipment.

#### SPECIAL UPGRADE BONUS ñ SYDNEY-PERTH-SYDNEY

If you wish to join our flight in Sydney, we will provide you with the Sydney-Perth-Sydney for only USD110. If you have booked a First Class seat on the Eclipse flight, we will provide you with First Class travel Sydney-Perth-Sydney for only USD110.

If you have booked a Business Class seat on the Eclipse flight, we will provide you with a First Class seat on the Sydney-Perth-Sydney flight for the first 7 people booked and a Business Class seat on the Sydney-Perth-Sydney flight for other passengers for USD110.

If you have booked an Economy Class Eclipse window seat on the Eclipse flight, we will upgrade you to Business Class on the Sydney-Perth-Sydney flight and provide you with that flight for only USD110.

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If you have booked any other Eclipse Economy seat on the Eclipse flight, we will provide you with an Economy Class seat Sydney-Perth-Sydney for USD110 or Business Class is USD210.

#### RESERVATIONS

Only 48 window seats are available on the Eclipse side. Already 23 of these have been booked. To confirm your seat we require a deposit of USD200 at this stage. This amount is refundable less a handling fee of USD100 per person until 23 February 2003. We are currently preparing a brochure, which will be available in mid January. Once the brochure, with final conditions is available, we require an additional USD800 by 23 February 2003. The balance of the fare is due by 23 July 2003. Both the deposits and final payments are non refundable.

While no guarantee can be given of clear viewing of the Eclipse or of the sights in Antarctica, we believe that clear viewing of the Eclipse can be achieved by the aircraft climbing above normal cloud systems in the region and our past experience and flexibility of routing over Antarctica has provided us with clear viewing of the sights on the ground on our previous flights. No refund or compensation can be offered in the unlikely event of viewing being obscured or limited in any way.

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Schedules are being arranged to ensure there is significant margins should the aircraft be delayed departing Perth for any reason. In the extremely unlikely event the flight is delayed by over 4 hours and misses the Solar Eclipse, monies paid will be refunded in full if requested prior to departure, but no further compensation will be considered. We and Qantas will do all possible to ensure that there is no likelihood of a delayed departure of this important flight.

Should you require any further information please Email ñ

HYPERLINK <mailto:Gayle.browne@croydontravel.com.au>  
Gayle.browne@croydontravel.com.au or call

Gayle, Jenny or Phil on ++61397258555 during business hours 2300UT-0730UT) ñ 1hr later 28 Oct-30Mar

Total Eclipse Flight 23-24 November 2003

Reduced prices USD

Eclipse First Class \$6,000

Eclipse Business Class \$5,500

Eclipse Business Class restricted viewing(16A&30A) \$5,000

Eclipse Business ñ row of two \$7,000 REDUCED

Eclipse Business ñ restricted viewing row of two \$6,300 REDUCED

Eclipse Business Class adjacent to window seat \$2,200 REDUCED

Eclipse Business adjacent to Window seat (restricted view) \$1,600

Eclipse Premium Economy Window \$4,000

Eclipse Economy adjacent to Premium window seat \$1,200 REDUCED

Eclipse Premium Economy aisle seat \$ 800 REDUCED

Eclipse Premium Economy ñ row of three \$5,500 REDUCED

Eclipse Premium rows of two (70-73) \$5,200 REDUCED

Eclipse Standard Window (over or near wing) \$3,500

Eclipse Standard Adjacent to Window seat (over or near wing) \$ 820

Eclipse Standard Aisle seat same row (over or near wing) \$ 650

Eclipse Standard ñ complete row \$4,500 REDUCED

For seating see attached plan

We look forward to sharing this wonderful experience with you in 2003.

Phil Asker Managing Director Croydon Travel 34 Main Street Croydon Victoria 3136 Australia Ph: 613 97258555 Fx: 613 97239560 )mailto:Gayle.browne@croydontravel .com.au <http://www.antarcticaflights.com.au>

From: [solareclipsewebpages@btopenworld.com](mailto:solareclipsewebpages@btopenworld.com)





## Joanne & Patrick

*The sole Newsletter dedicated  
to Solar Eclipses*



### Jo with eclipse equipment in Singelele

*(Continued from page 62)*

Hi, please have a look in the December issue of the Solar Eclipse Newsletter where you will find the pricing and details of the Croydon flight.

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

at [http://solareclipsewebpages.users.btopenworld.com/SENL\\_files/SENL.html](http://solareclipsewebpages.users.btopenworld.com/SENL_files/SENL.html)

or [http://solareclipsewebpages.users.btopenworld.com/SENL\\_files/Senl200212.PDF](http://solareclipsewebpages.users.btopenworld.com/SENL_files/Senl200212.PDF)

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

I hope I have the links right this time ... PP

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**MrEclipse.com**

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