

# SOLAR ECLIPSE NEWSLETTER

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**THE SOLAR ECLIPSE  
MAILING LIST IS MAINTAINED BY THE LIST OWNER PATRICK POITEVIN AND WITH THE SUPPORT OF JAN VAN GESTEL**

### HOW TO SUBSCRIBE:

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

### The Solar Eclipse Mailing List

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

Thanks to the voluntary efforts of Jan Van Gestel of Geel, Belgium, the Solar Eclipse Mailing List (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, which will then forward your e-mail to all the subscribers on the list. Likewise, you'll receive email messages that other subscribers send to the listserv. Only subscribers can send messages.

## The sole Newsletter dedicated to Solar Eclipses

Dear All,

We are getting closer to the next solar eclipse event. Many of you booked in the meanwhile a trip to Mexico for the annular eclipse of 10 June 2002. Some of you will make attempts to observe from the ocean by boat or ship.

Joanne and I booked as well the flights and will travel around as we did before: Public transport, back pack and as cheap as possible accommodations. We are sure we will meet many of you in Puerto Vallarta. It will be the Mecca of the 11 June 2002 eclipse. Be there!!!

But after June it will be soon December. Africa or Australia? Most of us made up their mind. It is getting harder to make reservations for that eclipse trip. It was mentioned on the SEML, that finding accommodation is getting rare. We'll see when the time is there. Every eclipse has its overreactions and over bookings...

This SENL issue is again full of information,

gathered from the SEML but as well from other solar eclipse related sources. If you want to contribute, please send us a message.

As you will notice, Glenn Schneider has been put in the solar eclipse spotlight. We hope we can highlight some one else from the SEML soon. We thought it was a nice idea.

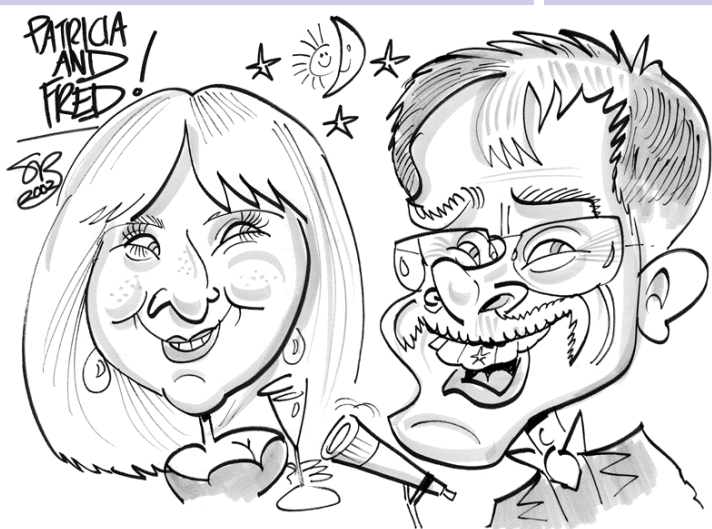
Barrie Jones from the Open University of Milton Keynes, has been promoted to Professor in Astronomy. Congratulations from all of us. Barrie did some great work on shadow bands studies. For us, he is as well the wonderful support in the use of the Open University facilities for Totality Day (TD) and Solar Eclipse Conference (SEC).

Last but not least, although we put some wedding contributions in the previous SENL issue, we added some more in this March issue. Below a caricature of Pat Totten and Fred Espenak, made at our wedding. And inside you will find the readings we had by Laura Appleton, Pat Totten and Darrel Barr.

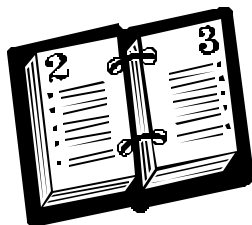
Thank you all for your nice messages and congratulations.

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

Patrick and Joanne

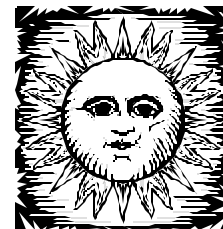


## SECalendar



Dear All,

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



### March 2002

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

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

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

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

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

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

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

March 03, 1985 Death of Iosif S. Shklovskii, Russian astronomer. He studied the corona and proved a temperature of millions degrees. Born in 1916. Ref. DD 03/99.

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

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

March 04, -0180 (181 BC) "Year 121 (SE), King An(tiochus), month XII, 29 solar eclipse beginning on the north-west side. In 15 deg day [. . .] over a third of the disk was eclipsed. When it began to become bright, in 15 deg day from north-west to east it became bright. 30 deg total duration. [During this eclipse] east (wind) went. During this eclipse [. . .], Venus, Mercury and Saturn

(Continued on page 3)

## SECalendar

[stood there]. Towards the end of becoming bright, Mars rose (?) The other planets did not stand there. (Began) at 30 deg (= 1) beru after sunrise." Refers to a partial solar eclipse of 14 March 190 BC. Babylon. Babylonian tablet in the British Museum. Quoted in Historical Eclipses and Earth's Rotation, by F Richard Stephenson, Cambridge University Press, 1997, pages 121 and 135.

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

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

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

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

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

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

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

March 05, 1989 Minor Planet (4105) Tsia 1989 EK. Discovered 1989 March 5 by E. F. Helin at Palomar. Named in honor of the ancient sun symbol used by Indians of the Zia Pueblo in central New Mexico (one of the Seven Golden Cities of Cibola sought by Coronado). Although the symbol's name is normally written "Zia", "Tsia" is the spelling in Keresan, the native language of the Zia Pueblo Indians. The symbol now adorns the New Mexico state flag and is often taken as an emblem of the state. It represents first and foremost the sun, the giver of life. From this symbolic sun there radiate four rays consisting of four tongues each; these represent the four cardinal directions (north, south, east and west), the four seasons (spring, summer, fall and winter) and the four stages of life (childhood, youth, adulthood and old age). Also, as ascribed in the official salute to the New Mexico state flag, the Zia is the "symbol of perfect friendship among united cultures". (M 16443) Name proposed by the discoverer, following a suggestion of Louie V. Burke as part of a project during an undergraduate astronomy class at New Mexico State University. Citation prepared by Alan Hale, instructor of the class. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

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

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

March 06, 1975 Minor Planet (2273) Yarilo 1975 EV1. Discovered 1975 March 6 by L. I. Chernykh at Nauchnyj. Named for the

*(Continued on page 4)*

## SECalendar

ancient Slavic god of the Sun, spring, fertility and love. (M 7783) Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

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

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

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

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

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

March 10, 0601 On 10th March there was an eclipse of the sun, recorded on a stone tabled. Ref. BAA 6/00

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

March 12, 1835 Birth of Simon Newcomb (1835-1909). He used carefully analyzed measurements of stellar and planetary positions to compute motions of the sun, moon, planets, and their satellites. Measured distance to the Sun.

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

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

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

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

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

## SECalendar

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

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

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

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

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

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

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



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

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

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

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## SECalendar

from Year 1 by Williams.)

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

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

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

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

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

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

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

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



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

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

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

(Continued on page 7)

## SECalendar

by B. Hetherington. Dictionary of Minor Planet Names - ISBN 3-540-14814-0 - Copyright © 1999 by Springer-Verlag Berlin Heidelberg

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

Best regards, Patrick



Model of Griffith Observatory  
Los Angeles, USA.

Works started January 2002 and  
will end in 2005.

Picture by PP

### **When two souls** by Victor Hugo

(Read by Pat Totten at Jo's and PP's wedding 02.02.02)

When two souls, which have sought each other for however long in the throng, have finally found each other, when they have seen that they are matched, are in sympathy and compatible, in a word, that they are alike, there is then established for ever between them a union, fiery and pure as they themselves are, a union which begins on earth and continues for ever in heaven. This union is love, true love, such as in truth very few men can conceive of, that love which is a religion, which deifies the loved one, whose life comes from devotion and passion, and for which the greatest sacrifices are the sweetest delights.

### **Love's Philosophy** by Percy Bysshe Shelley

(Read by Laura Appleton at Jo's and PP's wedding 02.02.02)

The fountains mingle with the river  
And the rivers with the ocean,  
The winds of heaven mix for ever  
With a sweet emotion;  
Nothing in the world is single,  
All things by a law divine  
In one another's being mingle-  
Why not I with thine?

See the mountain's kiss high heaven  
And the waves clasp one another;  
No sister-flower would be forgiven  
If it disdain'd its brother:

And the sunlight clasps the earth,  
And the moonbeams kiss the sea-  
What are all these kissing worth,  
If thou kiss not me?

## SEScannings

### New Book Morsels

From : "Patrick Poitevin" <patrick\_poitevin@hotmail.com> To : SOLARECLIPSES@AULA.COM Date : Tue, 19 Feb 2002 05:48:13 +0000

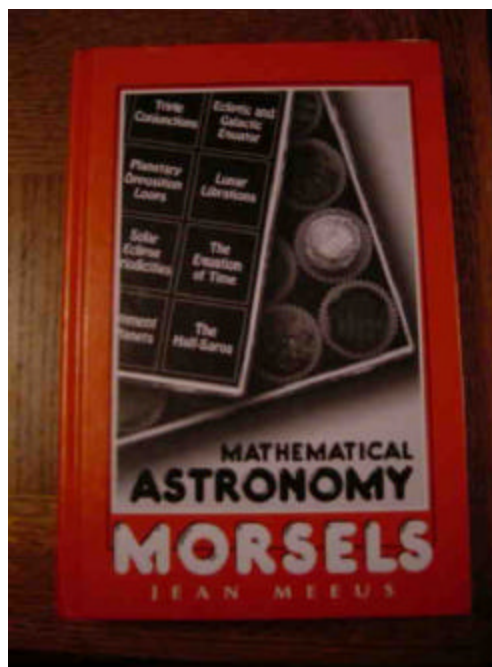
For those who know about the solar eclipse related issues in the first edition of Meeus' Mathematical Morsels book:

Dear, I am happy to tell you that my new book is now available: "More Mathematical Astronomy Morsels" (2002) by Jean Meeus Published by Willmann-Bell, P.O. 35025, Richmond, VA 23235, U.S.A. Fax (804) 272-5920 [www.willbell.com](http://www.willbell.com)

With a total of 429 pages, it is 50 pages thicker than the first Morsels book (1997). It is a completely NEW book, NOT a new edition of the Morsels book of 1997.

The book has 75 chapters, and here are some of the subjects covered:

- The Harvest Moon,
- The duration of the lunation (and the periods of 8.85 and of 184 years),
- Extreme perigees and apogees of the Moon,
- The brightest Full Moon and the phase effect,
- The number of total solar eclipses per year,
- Total solar eclipses per country,
- Three total solar eclipses in a short interval (at a given place),
- "Painted Globe",
- Long eclipseless periods (at a given place),
- Total solar eclipses of long duration,
- Is a non-central annular-total solar eclipse possible?
- Solar eclipses: Duos and Double Duos,
- Lunar eclipses of long duration,
- Simultaneous occultations of planets,
- Occultations of bright stars by planets, by minor planets,
- Mutual occultations of planets, of minor planets,
- Long-period variations of the orbit of Venus, of Earth, of Mars,
- Mars' closest approaches to Earth,
- The recovery of minor planet Albert,
- Cruithne, an asteroid with a remarkable orbit,
- Motion of a satellite with respect to the Sun,
- Venus-Jupiter conjunctions,
- close planet-star conjunctions,
- Jupiter-Regulus conjunctions,
- Venus and the Pleiades,
- Planetary groupings,
- Illuminated fraction and greatest elongation,
- On the changing aspect of Saturn's ring,
- Equinoxes and solstices on Uranus and Neptune,
- Transits as seen from Pluto,
- About the shortest day,
- Pole and constellations,
- Zodiacal constellations,
- Gregorian calendar and the tropical year,
- Shortest and longest twilight,
- The Simplex method and the least distance between two planetary orbits,
- Astronomical anomalies?



Jean Meeus' first Morsels book

(Continued on page 9)



## SEScannings

- Some popular misconceptions.

The book should be ordered either through a bookseller, or directly from Willmann-Bell. Sorry, I cannot provide the book myself. I received only ONE copy from the publisher, so I am unable to offer one even to friends! And at this moment I don't know the price. Best regards. Jean Meeus

From : Evan Zucker <ez@AbacusTotality.com>

I just checked that web site, and I don't see this book listed. I assume you can order it by phone, but it appears that it's not yet available for ordering on-line. It's also not listed at amazon.com. -- EVAN

### SEScannings - BAA Journal Feb 2002

From : "Patrick Poitevin" <patrick\_poitevin@hotmail.com> To : SOLARECLIPSES@AULA.COM Date : Wed, 20 Feb 2002 06:09:33 +0000

Journal of the British Astronomical Association 2002 February, Vol. 112 No. 1

Early sungrazer comets by Kenelm J. England, pages 13 to 28

Very interesting and original report about sungrazers. Lists as well other possible eclipse comets then listed in mine. Other possible candidates are 1375BC, late 2nd millennium BC, 116BC, 612AD.

The annular solar eclipse of 2003 May 31 by Peter Macdonald, pages 29 to 34

Summurazes the visibility of the annular eclipse, and more specific to the British isles. Highest altitude will be for Shetland at Lerwicj with 4 degrees sun altitude and a duration of 1m27s. In Unst the entire eclipse is visible. Both the Hebrides north of Tarbert and in Shetland the possibility of a clear sky during annularity is in theregion of 15 to 20 percent. Shetland seems themost favourable area from which to view the eclipse.

This issue mentions as well book reviews:

Journey from the Center of the Sun by Jack B. Zirker (Princeton University Press)

Solar observing rechniques by Chris Kitchin (Springer Verlag)

The Cambridge Encyclopedia of the Sun by Kenneth R. Lang (Cambridge University Press)



Please see: <http://www.ast.cam.ac.uk/~baa/> and <http://www.britastro.org/> and <http://www.britastro.org/journal/>

### Sky and Telescope article on the Value of Eclipses

From : Jay.M.Pasachoff@williams.edu To : solareclipses@aula.com Date : Mon, 11 Feb 2002 11:42:15 -0500

Sky and Telescope has just opened a new Web site at [www.SkyandTelescope.com](http://www.SkyandTelescope.com). It includes an index to all issues of the magazine and, for a fee, printouts of articles since mid-1996. In particular, my article "Solar-Eclipse Science: Still Going Strong," with the Box about Patrick Poitevin's conference in Antwerp, which appeared together in the February 2001 issue, are available at [http://SkyandTelescope.com/magazinearchive/search/results.asp?pdf\\_url=200102/20102040047.pdf](http://SkyandTelescope.com/magazinearchive/search/results.asp?pdf_url=200102/20102040047.pdf)

for a fee that is \$2.95 for an individual article though subscribers can sign up for a year's archival subscription for \$9.95 (and nonsubscribers can do so for \$19.95). Jay Pasachoff



## SETalk

**SENL Index February**

Please find herewith the contents of the February 2002 issue of the Solar Eclipse Newsletter. Beside the topic, the page number is listed:

.../...

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

SENL:

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

Index:

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

Example: SENL0011.pdf:

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

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

Cheers, Patrick

**HESSI is Operational**

From "Brian R. Dennis" <[Brian.R.Dennis.1@gsfc.nasa.gov](mailto:Brian.R.Dennis.1@gsfc.nasa.gov)> 15 Feb 2002

We are very pleased to announce that HESSI is now operational. It detected its first flare, a C2 flare early on Tuesday morning, February 12, starting at 0214 UT. All nine detectors are cooled to about 75 K, the high voltages are on at their full level, and all detectors are operating nominally. So far, we have seen modulation in the detector behind the coarsest grid. The spacecraft is balanced and spinning at 14 rpm about an axis within about 0.1 degrees of the Solar Aspect System (SAS) axis. We should get accurate aspect information once the data from the SAS and the Roll Angle System are fully analyzed. The instrument was launched with all of the thin shutters fixed in place so we have significant attenuation below 10 keV. Once we have seen a few flares, we will activate the shutter system, thus allowing weaker flares to be detected and larger flares to be recorded without saturation. Additional calibrations and tweaking of the systems are still ongoing but we expect to be able to record every flare visible to us and to have full imaging spectroscopy capabilities by applying the new calibrations to the data retroactively.

With HESSI now operational, we encourage all solar observatories to participate as much as possible in making joint observations of solar activity. The HESSI Home Page is at <http://hesperia.gsfc.nasa.gov/hessi/>. Bob Lin and Brian Dennis

**Airborne Solar Eclipse Observaton Planning & Navagation**

From : "Glenn Schneider @ Home" <[ggschneider@mac.com](mailto:ggschneider@mac.com)> To : SOLARECLIPSES@AULA.COM Date : Sun, 17 Feb 2002 23:31:13 -0700

I have recently had a number of direct (off-SEML) queries regarding planning observations of TSEs from aircraft. As I thought this might be of more general interest, I have summarized how I go about this. For those interested, see:

[http://nicmosis.as.arizona.edu:8000/ECLIPSE\\_WEB/EFLIGHT/EFLIGHT.html](http://nicmosis.as.arizona.edu:8000/ECLIPSE_WEB/EFLIGHT/EFLIGHT.html) Cheers, -GS-

**Next Lunar eclipses**

From : "ccmlt" <[ccmlt@wanadoo.fr](mailto:ccmlt@wanadoo.fr)> To : <[SOLARECLIPSES@AULA.COM](mailto:SOLARECLIPSES@AULA.COM)> Date : Thu, 31 Jan

Dear friends, I was looking at the next lunar eclipses maps and circumstances and was quite surprised to found that the next 4 total eclipses will be successive in less than 18 month and all be visible from Europe, NW Africa and south America between may 2003 and october 2004. North America will miss only the may 4 2004 eclipse. Such circumstance never happens for western european observers since the 1949-50 serie. Quite a long time ! In fact the last 4 successive and total lunar eclipses serie was visible from the same continent during the 1985-86 serie. This eclipses were observable from north America. Probably a great opportunity to compare many totalities with different path in the earth's shadow over a short period !

I begin to cross my fingers for a cooperative weather !  
Christophe

**Delta T**

From : Jean Meeus <[JMeeus@compuserve.com](mailto:JMeeus@compuserve.com)> Date : Tue, 5 Feb 2002 02:18:52 -0500

On 2002 January 1, the value of Delta T (the difference between the uniform Dynamical Time and Universal Time) was 64.30 seconds.

This is an increase of only 0.21 second with respect to 2001 January 1. Jean Meeus

## SETalk

**Glen Schneider's Eclipses CV**

1970 Greenville, NC USA	2m 53.6s	35° 36'N 77° 22'W
1972 Cap Chat, Quebec CANADA (clouded out)	2m 14.7s	49.1° N 66.7° W
1973 Atlantic Ocean (off Mauritanian coast; HMS Canberra)	5m 45.1s	47° 48'N 21° 12'W
1974 Cape Leeuwin, SW AUSTRALIA	3m 51.0s	34° 21'S 115° 07'E
1976 Mt. Delegate, NSW AUSTRALIA	2m 48.6s	37° 07'S 148° 54'E
1977 north of Bogota, COLOMBIA (clouded out)	0m 38.0s	04° 56'N 74° 47'E
1979 Roy, Montana USA	2m 39.5s	47° 17'N 108° 44'W
1980 Fundisa Kibioni, KENYA	4m 06.0s	02° 56'S 40° 08'E
1981 Bratsk (Tarma), Siberia [former] USSR	1m 50.4s	55° 59'N 101° 18'E
1983 Tunjun Koduk, Java, INDONESIA	5m 15.0s	06° 53'S 112° 23'E
1984 Pacific Ocean (off New Calidonian cost; Cap du Pain)	1m 33.7s	22° 52'S 164° 57'E
1986 N. Atlantic @ 44,000 ft (Cessna Citation II from Rejkavik)	0m 05.2s	59° 23'N 39° 38'W
1988 Banka Island, INDONESIA	2m 26.0s	02° 24'S 106° 16'E
1990 Atka Island, Alaska USA (clouded out)	1m 31.2s	52° 14'N 174° 12'W
1991 Buena Vista, Baja California MEXICO	6m 53.8s	23° 33'N 109° 43'W
1992 S. Atlantic @ 41,000 ft (DC-10 from Rio de Janario)	6m 15.0s	24° 57'S 27° 43'W
1994 Huachacalla, Bolivia	3m 07.7s	18° 47'S 62° 22'W
1995 Ghanoli, Dehli, India	0m 56.9s	27° 04'N 77° 32'E
1997 Chita, Siberia, Russia	1m 53.2s	52° 17'N 104° 17'E
1998 Carribbean Sea (off Aruba; HMS Vandeem)	3m 43.0	12° N 69° W
1999 Black Sea (off Bulgaria; Stellar Solaris)	2m 21.0s	43° 07'N 29° 43'E
2001 Lower Zambezi National Park, ZAMBIA	3m 30.5s	15° 40'S 29° 27'E
2002 NEXT... Sunset Eclipse from Southen Australia		
2003 In preparation: Airborne over Antarctic Ocean		

TOTAL TIME IN THE LUNAR UMBRAL SHADOW: 01h 06m 19.1s  
(and a 7-second annular, and, 0.4% [by area] partial of note...)

Birthplace (Spatial and Temporal) New York City (NYC), New York 12 October 1955 04:27 EST (JD=2450212.00178)

Home Town "da Bronx". (The only NYC borough attached to the mainland of the USA.)

High School Bronx High School of Science (class of 1972)

College (Undergraduate) New York Institute of Technology (class of 1976; B.S., Physics)



College (Graduate) University of Florida (class of 1985; Ph.D., Astronomy)

#### Outside Interests

- \* Eclipse Chasing (now that IS an "outside" interest)
- \* Caving (hmmm... I guess this is an "inside" interest)
- \* Photography
- \* Classical Music
- \* Cooking

(Continued on page 12)

## SETalk

\* Introducing Egg Creams to folks in remote corners of the globe

General Scientific Interest

\* The low-luminosity end of the stellar mass function

\* Stellar evolution

\* Formation and stability of stellar and planetary systems

\* Circumstellar and Protoplanetary Disks, Circumstellar Material

\* Brown Dwarfs, EGPs and the transition from stars to planets in the mass-spectrum

\* Stellar Populations

\* Binary Stars

Past Major Scientific Areas

\* Determination of stellar diameters and duplicity by lunar



Glenn Schneider, Laura Kay, and Opus  
Amundsen-Scott South Pole Station  
December, 1984



occultations

\* Numerical Modeling of Stellar Structures and Evolution

\* White Dwarf Stars

\* Wolf-Rayet Stars

\* Eclipsing & Interacting Binary Stars

\* Asteroids

Spouse: Karla Yrs Rahman-Schneider

Child: Maia\* Alice Rose Schneider

\* 20 Tauri, in the Pleadies,  $V=3.86$ ,  $sp=B7III$   
"...and queenly Maia...by the will of Zeus illustrious... ",  
Aratus, 3 B.C.

Personal Biography

In real life (i.e., what pays the mortgage), Glenn Schneider is the Instrument Scientist for the Near Infrared Camera and Multi-Object Spectrometer. NICMOS is a second generation instrument which was installed in the Hubble Space Telescope during it's second servicing mission in February of 1997.

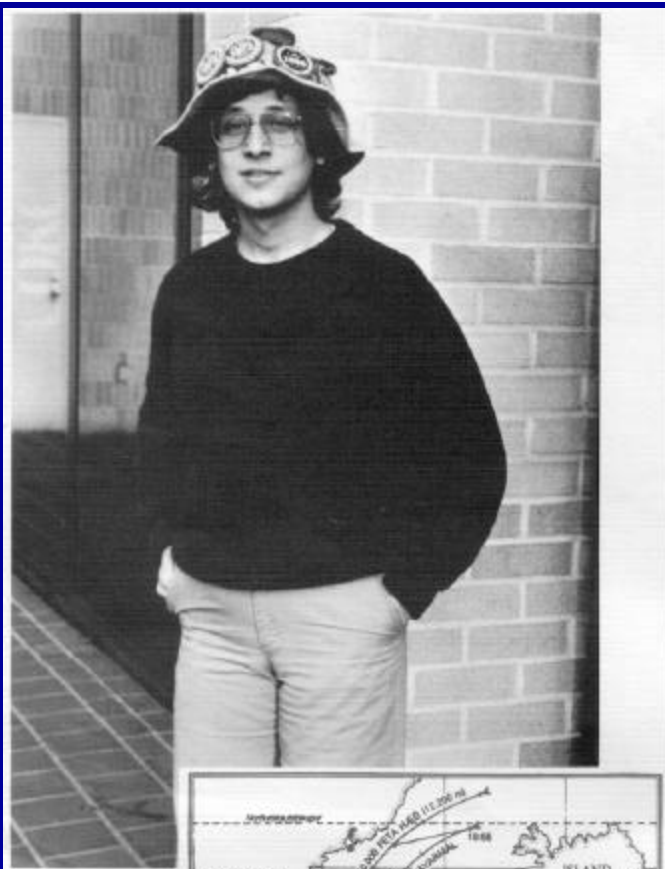
Glenn Schneider is an UMBRAPHILE. Literally a "shadow lover", but properly applied, one who is addicted to the glory and majesty of total solar eclipses. Those who have basked in the moon's shadow will know what I mean without further explanation. Those who have not may have difficulty in understanding that umbraphillia is not only an addiction, but an affliction, and a way of life. The real reason d'etre for many of us. The more common and prolific term "solar eclipse chaser" is nearly synonymous, but somehow does not convey the depth of commitment to this lifelong endeavor. Once every 16 months, or so, (on average) umbraphiles will drop whatever they are doing and trek by plain, ship, train, foot, and camel-back to gather along a narrow strip in some remote God-forsaken corner of the globe defined by the inexorable laws of celestial me-

(Continued on page 13)

## SETalk

chanics. Newtonian physics heeds no national boundaries, and neither do umbraphiles. Wherever the solar photosphere will be extinguished, enshrouded by the ashen lunar disk, umbraphiles will revel in the quasi-twilight darkness.

Glenn has basked in the moon's umbral shadow twenty-two times since seeing his first Total Solar Eclipse in 1970. Remaining mobile and aggressively seeking clear skies, he has suffered the trauma of being clouded out three only times (a track record, no pun intended, of 93.4% by time, 86.4% by number):



Glenn Schneider, wearing his "eclipse" hat, stands outside the STScI where he works with a group that is developing and implementing procedures for operating different science instruments on the Space Telescope. (Inset) A map from an Icelandic newspaper showing path traveled by Schneider and his colleagues while chasing the annular/total solar eclipse last fall. (Photo by Maggie Mogck)

**Longitude by lunar eclipse**

From : rdickson@achilles.net To : eclipse@hydra.carleton.ca Date : Sun, 24 Feb 2002 12:04:24 -0500

I came across a brief reference to an attempt in 1634 to measure the length of the Mediterranean by using a lunar eclipse.

The reference I found was one sentence in a 1998 translation of Total Eclipses (English name) by Pierre Guillermier and Serge Koutchmy.

I would appreciate hearing from anyone who may be familiar with this particular bit of science, or who may know of a detailed reference to the event. I presume it was written up at the time and probably several times since. Thanks Ross

From : Gessner <gessner@easynet.fr>

sorry, I'm not, but it sounds interesting indeed. Could you please let us know that one sentence you are referring to? Thanks Nicolas Gessner gessner@easynet.fr

**Pretty nice solar prominence this morning**

From : "Olivier \"Klipsi\" Staiger" <olivier.staiger@span.ch> To : <SOLARECLIPSES@AULA.COM> Date : Mon, 18 Feb 2002 07:10:17 +0100

check out SOHO's view of a huge prominence this morning. Darn ! No eclipse today ;-( [http://sohowww.nascom.nasa.gov/data/realtime/javagif/gifs\\_small/20020218\\_0119\\_eit\\_304.gif](http://sohowww.nascom.nasa.gov/data/realtime/javagif/gifs_small/20020218_0119_eit_304.gif)

From : "76630,2206" <76630.2206@compuserve.com>

Klipsi: Thanks for telling me. The sun just rose and it will be an hour before it clears the trees. I'll be on it with my Coronado filter. Robert B Slobins



Design of Sun and Moon in door of The Eclipse Inn in Winchester, UK (picture by PP)

## SETalk

### New video

From : "Olivier \"Klipsi\" Staiger" <olivier.staiger@span.ch> To : <SOLARECLIPSES@AULA.COM> Date : Sun, 10 Feb 2002 21:38:54 +0100

howdy, folks, another new eclipse video clip on my page, for those with Real Player and fast connection ( LAN, or better CABLE, ADSL) <http://eclipse.span.ch/highmoon2.rm> this is a mix of various of my eclipse photos and videos, in synch with a famous space sound. ;-)

check out also <http://eclipse.span.ch/antarctica03.rm> (RealPlayer, LAN or faster) for a mix of my best images, eclipses and other, with great music again.

and for those who like thunderstorms , see <http://eclipse.span.ch/thunderstorm.mpg> (3.2 Mb, MPEG).

(note: if it don't work when clicking on it, it may work by first opening RealPlayer, then entering the URL in the Player directly)

more video on <http://eclipse.span.ch/video.htm>

P.S. I will soon have 512 kb ADSL connection, will be able to upload larger files , for viewing by those who have fast connection ( 256 kb or more). Klipsi

### The Sunrise High Resolution Balloon Program

>From Bruce Lites <lites@hao.ucar.edu> 12 Feb 2002

NASA has recently announced funding support of the US portion of the international Sunrise program. The objective of this program is to investigate solar magnetic processes acting at very small scales, and their consequences for larger scale phenomena.

A long duration, high altitude, Antarctic balloon flight will carry a 1-m diffraction-limited solar telescope and instrumentation to perform high resolution imaging, magnetometry, and spectro-polarimetry in the visible and ultraviolet, above more than 99% of the atmosphere and its associated image disturbance. Diffraction-limited imaging in a atmospheric transmission window at 200 nm will provide solar image sequences with a resolution approaching 35 km on the Sun.

The Gregorian telescope features a lightweight primary mirror fashioned from silicon carbide ceramic. The instrumentation will include an imaging magnetograph, a high resolution visible/ultraviolet phase-diverse imager, and a precision visible light spectro-polarimeter(SP). The US will provide the balloon gondola and launch services. Spain will provide the imaging magnetograph. Germany will provide the telescope and high resolution imager. The US and Germany will share in development of the SP. Scientists and technical staff from the following institutions are involved in this effort: High Altitude Observatory/NCAR, Lockheed Martin Solar and Astrophysics Laboratory, National Solar Observatory, and University of Chicago (US); Max Planck Institut fur Aeronomie and Kiepenheuer Institut fur Sonnenphysik (Germany); Instituto de Astrofisica de Canarias (Spain).

The long duration Antarctic balloon flight is anticipated for the austral summer 2006-2007.

(This program is entirely independent of the NSF SunRISE program.)

## SETalk

**Planet Occultations During Lunar Eclipses**

From : "J.P. van de Giessen" <janpieter@giessen.fol.nl>  
 To : <SOLARECLIPSES@AULA.COM> Date : Thu, 14  
 Feb 2002 21:10:13 +0100

Hy all, I found on a website (<http://hea.iki.rssi.ru/~denis/ploclec.htm>) the following text:

>Planet Occultations During Lunar Eclipses Joe Rao in September, 1996 issue of Sky & Telescope considers a question of close (less than 5 degrees) conjunctions of bright planets and 1st magnitude stars with eclipsed Moon. I was wondering if eclipsed Moon could ever OCCULT Mars, Jupiter or Saturn. Upon investigating Russian literature on this subject I've found the answer! Here it is: Jupiter will be occulted by eclipsed Moon on 10th of June, 2932 (!!!) Mars - almost 500 years earlier: on 26th of April, 2488 and Saturn - "only" in 3.5 centuries, on 26th of July, 2344! Thus, although it will finally happen, no one presently living on Earth will be able to see it with his/her own eyes. Even more, no occultations of Regulus by the eclipsed Moon is expected before 22nd of February, 2445! Source: Solar and Lunar Eclipses by M.M. Dagaev, Nauka (Science) Publishers, Moscow, 1st edition, 1978.

I wonder if there were any "double" eclipses in the past, and if so are they observed? Jan Pieter van de Giessen janpieter@giessen.fol.nl

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

>Even more, no occultations of Regulus by the eclipsed Moon is expected before 22nd of February, 2445!

however the Feb. 21 2008 total lunar eclipse will show Regulus occulted shortly before the eclipse as seen from some parts (South America) of the planet. For others it will be a close conjunction during totality. Beautiful ! Klipsi

From : Jean Meeus <JMeeus@compuserve.com>

Occultations of bright stars and of planets by the eclipsed Moon: this was the subject of two papers by G.P.Konnen (Netherlands) and myself (Jean Meeus, Belgium), published years ago in the Journal of the British Astronomical Association:

(1) "Occultations of Bright Stars by the Eclipsed Moon", JBAA, vol.85, No.1, pages 17-24 (December 1974).

(2) "Occultations of Planets by the Eclipsed Moon", JBAA, vol.87, No.2, pages 135-145 (February 1977).

The dates given by M.M.Dagaev (1978), cited in a previous message, are exactly OURS! So probably Dagaev simply took the dates from our work...! I have not seen Dagaev's book, so I don't know if he gives a reference.

The two articles cited above have been reproduced, slightly altered, as Chapters 22 and 23 of my book "Mathematical Astronomy Morsels" (Willmann-Bell, ed., 1997), where the interested reader can find full details. In particular, the list is given of \*all\* occultations of bright planets by the eclipsed Moon between the years -100 and +3000.

The occultation of Jupiter during the total lunar eclipse of 755 November 23 was observed in Europe. Jean Meeus

**Solar Max**

From : Evan Zucker <ez@AbacusTotality.com> To : SOLARECLIPSES@AULA.COM Date : Mon, 11 Feb 2002 23:32:18 -0700

It seems like ages ago that we were discussing the Imax film "Solar Max" here, specifically about it's views of a total solar eclipse. Unfortunately, it never played at the Fleet Space Theater in San Diego, except for a single showing for Astronomy Day, and so I never saw it.

I'm in Salt Lake City this week for the Olympics with my 8-year-old son. As we were driving north on I-15 approaching Salt Lake City I noticed a museum with a large dinosaur on the side. Turns out it is the new North American Museum of Ancient History, which features a "Mammoth Screen" theater (Imax, naturally). They were playing Solar Max, and so my son and I left the women's ice hockey match between Sweden and Russia after the second period so we could catch the film. (I've never been a big follower of women's ice hockey, although I was hoping that the Swedish bikini team might be there as cheerleaders).

We rushed to get there by show time, getting a bit lost in the tiny town of Lehi, Utah, arriving 2 minutes late. They let us in anyway -- unlike the Fleet, they started on time -- and we managed to find seats in the dark. It was really something to see this huge theater absolutely empty except for a single family of 4 in the back row center, with my son and me right in front of them. We suffered listening to their young children whine and having them kick the back of our seats before we moved a bit away.

Alas, the total solar eclipse took up just a couple of minutes of the film. Worse, it hardly took advantage of the Imax screen, with the moon/sun and corona filling just a small

## SETalk

*(Continued from page 15)*

fraction of the screen. The wide angle "crowd shot" during Totality was so dark I could hardly make out anything other than a couple of camera flashes. Fortunately, the rest of the film was better, in my opinion. The museum was outstanding, as small natural history museums go. They claim to have the largest display of dinosaur bones in the world, although I'm reserving judgment on that.

Evan Zucker, reporting from the XIX Olympic Winter Games

From : Evan Zucker <ez@AbacusTotality.com>

Before Jay privately corrects me: yes, I realize I should have said "its" instead of it's. Forgive me: it's late and I'm not used to typing on my laptop keyboard while on the road. -- EVAN

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

> Evan Zucker, reporting from the XIX Olympic Winter Games

hey Evan, I saw you from space ! see <http://olympics.gsfc.nasa.gov> , and click on image to zoom on you ;-) )

(sorry, Pat, I know this is offtopic ;-( please forgive me.... Klipsi



### SOLAR EXPLORER SUCCESSFULLY LAUNCHED BY PEGASUS ROCKET

After a 19-month delay, NASA's HESSI spacecraft was finally lofted into orbit Tuesday aboard an air-launched Pegasus rocket, but not without a hiccup in the countdown that forced officials to abort one attempt before succeeding a second time around.

<http://spaceflightnow.com/pegasus/hessi/index.html>

Solar explorer successfully launched by Pegasus rocket BY JUSTIN RAY SPACEFLIGHT NOW Posted: February 5, 2002

The L-1011 aircraft "Stargazer" takes off from Cape Canaveral to launch the Pegasus rocket with HESSI. Photo: NASA

After a 19-month delay, NASA's HESSI spacecraft was finally lofted into orbit Tuesday aboard an air-launched Pegasus rocket, but not without a hiccup in the countdown that forced officials to abort one attempt before succeeding a second time around.

Severely damaged in a testing mishap in March 2000 and grounded by four rocket-related concerns, the High Energy Solar Spectroscopic Imager was able to shake off its tough luck with a successful launch to begin a two-to-three year mission to observe the most powerful explosions in the solar system.

A Lockheed L-1011 carrier jet, called Stargazer, took off from Cape Canaveral Air Force Station, Florida, with the Orbital Sciences-built Pegasus mounted to its belly, heading over the Atlantic Ocean on a preset flight path -- dubbed "the race track" -- where the rocket would be dropped to soar into space.

The countdown was proceeding smoothly for launch at 3:28 p.m. EST when communications between the ground team and crew aboard the aircraft were lost in the final minutes. The link was restored with about three minutes until the planned drop time, but officials decided to abort the launch attempt as a precaution.

The L-1011 crew turned the plane around, making a U-turn in effect to get back into position to launch the Pegasus again.

The second try was the charm.

With a final "go" from the ground, pilot Rodney Boone in

*(Continued on page 17)*



## SETalk

the cockpit of Stargazer pushed the drop button and the 52,000 pound Pegasus rocket was released at 3:58 p.m. EST, free falling for five seconds to clear the plane before the first stage motor ignited.

Nine minutes and 42 seconds after the drop, HESSI was successfully deployed into space from the rocket.

"It looks like we had an excellent flight," said NASA Launch Manager Omar Baez. "(On) our initial attempt we lost communications with our L-1011 aircraft at a crucial point in the countdown. We decided to abort and recycle and go back into the 'race track' for a second attempt. We were able to pull that off and get HESSI up successfully into space."

Bryan Baldwin, Orbital Sciences' Pegasus launch vehicle program manager, said it was the first time a Pegasus countdown had been aborted only to have the countdown reset and carrier jet circle around to launch the rocket during a second try on the same day.

The launch team and scientists alike celebrated the delivery of HESSI into space after a long, sometimes frustrating road. The craft was supposed to fly in July 2000.

"For us at NASA, it is a tremendous load off our shoulders to get this mission behind us and move on and fly the rest of the Pegasus missions," Baez said.

"Terrific," said Robert Lin, HESSI's principal investigator from the University of California-Berkeley. "We couldn't have asked for a better launch."

HESSI's \$83 million mission, \$13 million more than originally planned because of the delays, will observe about 1,000 solar flares -- the massive eruptions on the sun. Flares can damage orbiting satellites, threaten the health of astronauts, disrupt communications and knock out power grids on Earth.

An artist's concept of HESSI studying the sun. Credit: NASA

"What we are interested in studying are solar flares, which are the most powerful explosions in the solar system. They release about a billion megatons' equivalent of TNT in the time scale of a few seconds to a few minutes," Lin explained.

Scientists will use HESSI to study the mysterious fundamental basics of solar flares -- where they are born, what triggers them and how they generate huge energy releases.

"HESSI is going to study the workings of the explosion itself," said Bill Wagner, the mission's program scientist from NASA Headquarters. "It is going to be making movies in X-ray light and gamma ray light, which has been impossible to do until this team from Berkeley came along and conceived and developed the HESSI mission."

A summer 2000 launch would have allowed HESSI to observe the flurry of solar flares during the peak of the 11-year cycle of activity on the sun, called the Solar Maximum.

Although the solar activity began to subside after peaking in mid-2000, another peak occurred late last year and early this year, giving scientists renewed hope of a successful mission.

Lin said larger solar flares are preferred for studying and they tend to erupt on the descending side of the solar peak, which is happening now.

The HESSI team is negotiating a six-month mission extension to see more flares, making up for those lost in the delays. Such an extension would cost \$2 million. Officials say HESSI would have seen about 2,000 flares had it been launched as planned.

Tuesday's launch was the 31st for the Pegasus rocket since debuting in 1990, the 21st in the XL configuration and the third to occur off Florida. Other launch sites used are in California, Virginia, the Kwajalein Atoll in the central Pacific Ocean and the Canary Islands.

As many as four more Pegasus missions may occur this year: NASA's Galaxy Evolution Explorer (GALEX) in July; the commercial OrbView-3 Earth-imaging spacecraft in September; NASA's Solar Radiation and Climate Experiment (SORCE) satellite in October; and the Canadian SciSat-1 ozone research probe in December.



## SETalk

**Triangular regions**

From : Jean Meeus <JMeeus@compuserve.com> To : Solar Eclipses <solareclipses@aula.com> Date : Thu, 31 Jan 2002 06:05:02 -0500

Related to the particularities mentioned by Glenn Schneider are what I call the "triangular" regions of some solar eclipses.

Look, for instance, at the map of the partial solar eclipse of 2000 December 25 on page 175 of Fred Espenak's "Fifty Year Canon of Solar Eclipses, 1986-2035". This eclipse was visible in the whole continental United States. In northern Canada there is a small triangular region. Within that region first contact took place before sunrise, maximum eclipse above the horizon, and last contact after sunrise. There, the solar eclipse lasted the whole day!

For instance, at longitude 82°W, latitude 6°N, the phases of the eclipse occurred as follows:

first contact 16:05 UT Sun's altitude = -1°  
 maximum eclipse 17:27 UT Sun's altitude = +1°  
 last contact 18:49 UT Sun's altitude = -1°

Another example is seen on page 196 of the same book: a small triangular region in northern Russia (eclipse of 2011 January 4).

Of course, the opposite may occur, too, first contact taking place before sunset, maximum eclipse below the horizon, and last contact again above the horizon (the "next" day!). Jean Meeus

From : "Carton, WHC" <Wil.Carton@corusgroup.com>

In addition to Jean Meeus mail:

About eclipse maps, Jean directs our attention to one triangle between three curves:

'a'. the curve 'eclipse ends at sunrise' that proceeds to 'eclipse ends at sunset' (it proceeds in what I call transition point A),

'b'. the curve 'max. eclipse at sunrise' that proceeds to 'max eclipse at sunset', (trans. pt. B),

'c'. the curve 'eclipse begins at sunrise', that proceeds to 'eclipse begins at sunset' (trans.pt. C).

Draw this for yourself and wonder what determines the transitionpoints A, B and C and where exactly.

My answer: These are the TANGENT points of the

curves a, b and c with the Earth's terminator = de boundary between the dayside and the nightside of the Earth. Those points are generally not indicated on eclipse maps.

But generally eclipse maps do show you the INTERSECTING points:

d. the intersection point of (above called) curve 'a' with 'b', giving a point P,

e. the intersection point of (above called) curve 'a' with 'c', giving a point Q,

f. the intersection point of (above called) curve 'b' with 'c', giving a point R.

Eclipse maps show you only the triangle PRQ, and that is the triangle Meeus talked about. (=PBRQ). Within that triangle the sun rises partially eclipsed before its maximal magnitude, and sets partially eclipsed after its maximal magnitude. No eclipse map I ever have seen with the other two triangles, but I am sure they must exist, just outside the : Triangle APB: here the sun rises partially eclipsed but after local maximum magnitude, Triangle BRC: here the sun sets partially eclipsed but before local maximum magnitude.

So if your professor examines your knowledge with the question: "Can any aspect of a solar eclipse be observed outside the limits of the Almanac's eclipse map?", then your answer must be: "... your honour, the answer is YES, in cases where the lunar penumbral cone of the eclipse covers polar regions and not fully enter on to the surface of the Earth, in Besselian elements spoken if Gamma plus 12 is in absolute value bigger than 0,999 (the radius of the flattened Earth)."

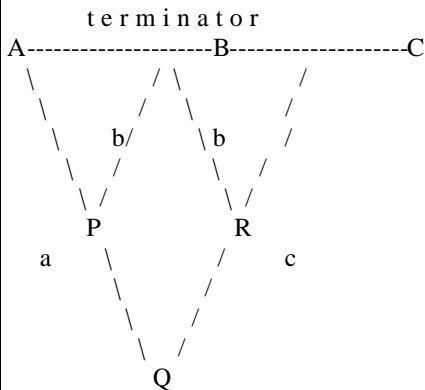
Must you want to travel to those triangles? Well, I think NO, except ... Olivier Klipsi Staiger!

In my explanation above, I have described the situation during the winter on that polar region: then the maximum phase of the partial solar eclipse is, within the triangle PRQ, just visible when it's is shortly above the horizon but most of the 24hours rotation period below the horizon. In the polar summer, the eclipse can occur during the midnight sun, and then this triangle is just the place where first contact occurs shortly before sunset, maximum is below the horizon, and last contact is visible shortly after sunrise of the next date!! Am I now a candidate for an astronomy diploma in honoris causa?? Wil Carton, Holland.

From : "Carton, WHC" <Wil.Carton@corusgroup.com>

Here is a schematic drawing of the Triangular regions: Indicated are the terminator and the curves 'a', 'b' and 'c'. (sorry that the schema enforced me the break in the curve 'b' where it passes through point B. In reality PB proceeds into BR without changing of direction).

## SETalk



So, that was my friday afternoon lecture. Wil Carton.

From : "76630,2206" <76630.2206@compuserve.com>

>Must you want to travel to those triangles? Well, I think NO, except ...  
Olivier Klipsi Staiger!

Well, I am sure that there are several thousand people in Russia, Scandinavia, Alaska and Canada that live in locations that could be covered in a triangle. Fairbanks, Alaska comes to mind. Now, would such an event in a populated area occur in our lifetime? -Robert B Slobins

From : Jean Meeus <JMeeus@compuserve.com>

Wil Carton is right: there are in fact \*three\* triangular regions. Only the biggest one appears on ordinary solar eclipse maps such as those in the 'Canon' of Fred Espenak. The reason is that the "limiting parallel of latitude" (ABC in Wil Carton's drawing) is not drawn on solar eclipse maps.

ABC has a latitude of  $90 \text{ deg} + d$ , where  $d$  is the Sun's declination. (Notice that  $d$  is negative under the assumed conditions: winter in the northern hemisphere). To the north of ABC, the Sun remains the whole day below the horizon.

At Q, the intersection of the curves "eclipse begins on the horizon" and "eclipse ends on the horizon", the eclipse begins at sunrise and ends at sunset.

The triangular regions APB and BCR (which don't appear on eclipse maps because on these maps the "limiting latitude" ABC is not drawn, are much smaller than the area PBRQ. In one of these regions, the eclipse begins before sunrise, while maximum eclipse AND end of the eclipse occur after sunset. In the other region, the eclipse begins AND reaches a maximum before sunrise, while the eclipse ends after sunset.

All three regions are smaller the more the eclipse takes place farther from the date of winter solstice. Close to the September of to the March equinox, the distance BQ is very small and the three triangular regions are almost non-existing. Jean Meeus

From : "Carton, WHC" <Wil.Carton@corusgroup.com>

Thank you Jean, for your well documented comment.

The brutal reality of the TSE of 24 Nov 2003 will be that the lunar umbra on the moment that its travel on Earth will finish, its "flank" along the northern pathlimit will touch/enter the triangle PQR (the Antarctic coast near the meridian of Capetown). On that small place the cruel joke will take place, that First Contact is visible in the local evening before the "midnight sun" shortly will set, that it will sink just below the southern horizon during increasing eclipse-magnitude to  $> 95\%$ , next the Total Eclipse will occur just BELOW the local southern horizon, and next that the early rising sun will become visible again (but shortly after totality) with decreasing eclipse-magnitude until Last contact. A cruel joke for those who spends a lot of money to be there and defies terrible cold. Wil Carton.



Wedding picture of Jo and PP by Barrie Pantling

## SETalk

**YOKKOH damaged by eclipse**

From : olivier.staiger@span.ch To : SOLARECLIPSES@AULA.COM Date : Sat, 23 Feb 2002 20:52:47 +0100 (CET)

according to french astro magazine, Ciel&Espace, March edition, page 19, YOKKOH , the japanese solar observation satellite, was damaged during the annular eclipse last december 14. It seems that Yokkoh passed inside the Moon's shadow cone( = saw a total eclipse, while we on Earth only had an annular). Result: satellite lost track of the Sun, so it went in "sleep" mode, switching off instruments. it started rotating, the solar panels didn't operate , and the batteries went low. They're now trying a rescue operation in the style of what was done a few years ago when SOHO was lost, and recovered. Anybody has any news on latest developements ? Klipsi

From : "Govert Schilling" <mail@govertschilling.nl>

See:

<http://isass1.solar.isas.ac.jp/nuggets/2001/011214/011214.html>

<http://isass1.solar.isas.ac.jp/nuggets/2001/011221/011221.html>

<http://spaceflightnow.com/news/n0201/28yohkoh>

--Govert <http://www.govertschilling.nl>

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

In late January the prospects of Yohkoh were still dire as reported in <http://www.spaceflightnow.com/news/n0201/28yohkoh> - though a later GSFC Press Release that mentioned the incident was slightly more positive.

BTW, I had drawn attention to the Yohkoh problems here last Dec., the key reference being [http://isass1.solar.isas.ac.jp/sxt\\_co/011221.html](http://isass1.solar.isas.ac.jp/sxt_co/011221.html) (there haven't been any updates on that site since). Regards, Daniel The Cosmic Mirror [www.astro.uni-bonn.de/~dfischer/mirror](http://www.astro.uni-bonn.de/~dfischer/mirror)

**Pat and Joanne's wedding present**

From : MrEclipses@aol.com To : SOLARECLIPSES@aula.com Date : Tue, 26 Feb 2002 07:09:46 EST

Dear Patrick and Joanne - Please don't read the rest of this message...

Now that I have everyone else's attention, I wanted to bring up the subject of a cash gift for PP & JP. This may be viewed as part wedding present and part financial compensation for the money they lost in hosting the 2000 eclipse conference in Antwerp. Olivier Staiger and Sheridan Williams suggested this idea recently and I volunteered to take up a collection in the US. It was suggested that if everyone on this mailing list contributed \$16, that would cover the 2000 conference expenses. Of course, the actual contribution and the cash amount are purely voluntary. I'd just like to remind everyone how hard the Poitevins work at providing us with the SEML. I think it would be a wonderful and inexpensive way of expressing our appreciation for all their efforts and to wish them good luck in their new future together.

So far, NOBODY has made a contribution and that is embarrassing! I hope that everyone will make an effort this week. The actual amount doesn't matter because it's really the thought that counts.

Please send your check (payable to Fred Espenak) with a copy of this email to:

Fred Espenak P.O. Box 141 Tracys Landing, MD 20771

At the end of February, I will send Patrick and Joanne one check for the sum amount collected along with a card listing everyone who contributed.

If you want to include a personal message/card along with your gift, I will forward that to P & J as well.

Thanks for your contribution! Fred Espenak

From : Henrik Glintborg <hg@etc.dk>

Hi Fred! Is it possible to transfer the money to you instead of sending a check? It would speed up things a bit for me. Otherwise I have to go to the bank and have them make an