

Solar Eclipse Conference

SEC2004



Open University
Milton Keynes UK
20 - 22 August 2004



20–22 August 2004

SEC2004

INDEX

Solar Eclipse Conference

Open University Milton Keynes (UK)

A CROSSROAD ON PHYSICS & ECLIPSES OF THE SUN

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Friday 20 August 2004

Entrance Main Reception of Berrill Building

18h00 Doors Open

18h30 Welcome and registration

19h00 Buffet

20h00 Jean Marc Lariviere (Canada) "Moving Eclipses - Eclipses in Films"

20h40 Babak A. Tafreshi and Hamid Khodashenas (Iran) "Shadow in the White Continent"

21h10 End

22h00 Doors closed

Saturday 21 August 2004

08h00 Doors Open Berrill Theatre

08h30 Welcome and registration

09h00 Opening SEC2004

09h10 Daniel Fischer (Germany) "Getting your own AU with transits of Venus"

09h30 Glenn Schneider (USA) "EFLIGHT 2003 - The Umbra on Ice from 35,000 ft"

10h00 Eckehard Schmidt (Germany) "Nuremberg - it's history of solar eclipses"

10h30 Break

11h00 Pierre Guillermier (France) "Eclipse Paintings in the XVI^e and XVII^e century : The Pieter Paul Ruben's Christ on the Cross and the Antoine Caron's Dionysius the Areopagite"

11h35 Rob van Gent (The Netherlands) "Early Examples of Eclipse Mapping"

- 12h00 Lunch
- 13h40 Chris O'Byrne (Ireland) "A calculator and timer for eclipse day"
- 14h00 Marcos A. Peñaloza-Murillo (Venezuela): "Radiative response of the sky and of the surface during the Solar Eclipse of 3 February 1916 at Tucacas and during the Solar Eclipse of 26 February 1998 in the Paraguana Peninsula on the Western Caribbean Coast of Venezuela"
- 14h30 Jean Paul Goddard (France) and Martine Tlouzeau (France) "Eclipses through Philately"
- 14h50 Jay Pasachoff (USA) "Solar Eclipse Science"
- 15h30 Break
- 16h00 Ralph Chou (Canada) "Eye Safety: Transmittance data, reports of eye injuries, law suits and more"
- 16h30 Leo Dubal (France) "Questioning Ancient Eclipse Records"
- 17h00 Friedhelm Dorst (Germany) "Three Exciting Black Moons"
- 17h30 Break
- 18h00 Mike Foulkes (UK) and Derek Hatch (UK) "Eclipse Imaging - 20 years of trying to improve"
- 18h40 Nigel Evans (UK) "Flash"
- 19h00 Jay Anderson (Canada) "2005 and beyond - a look at eclipse weather prospects for the next five years"
- 19h30 End Day one
- 20h00 Doors closed
- 20h30 Dinner Old Lecture Theatre

Sunday 22 August 2004

- 08h00 Doors Open Berrill Theatre
- 08h30 Welcome and registration
- 09h00 John Tilley (UK) and Luca Quaglia (Italy) "Solar Eclipse Explorer"
- 09h40 Serge Koutchmy (France) "Towards a higher spatial resolution in coronal total eclipse imaging"
- 10h20 Break

10h50 Tom van Flandern (USA) "View from the edge: The special phenomena that make totality so spectacular"
11h30 John Parkinson (UK) "A Sideways Look Back at the 1999 Eclipse in the UK"

12h00 Lunch

13h40 Fred Espenak (USA) "Eclipse Predictions for 2005 and Beyond"
14h20 Vojtech Rusin, Milan Minarovjech (Slovakia) and Miloslav Druckmuller (Czech Republic): "Image Processing"

15h00 Break

15h30 Richard Stephenson (UK) "Historical eclipses: then and now"
16h10 Peter Hingley (UK) "Picturing Eclipses; 500 years of Eclipse Imagery"

17h00 Closing SEC2004

17h10 End Day Two

18h00 Doors Closed

Posters SEC2004

In alphabetical order:

- Coronado (USA) "Solar Telescopes"
- EDP Sciences (France) "Astronomy and Astrophysics"
- Explorers Travel (UK) "Astronomy Expeditions"
- Denis Fiel (France) "The polarisation of the corona during the 2001 solar eclipse"
- Harald Frey (USA) "Solar Eclipses on the terrestrial dayglow from space - Far Ultraviolet Imager on the IMAGE spacecraft"
- Thomas Goodey (UK) and Prof. Dimitrie Olenici (Romania) "The Sun and solar eclipses as presented in traditional Romanian architecture"
- Serge Koutchmy (France) "Solar Eclipse of 1999 Iran, 2001 Angola and 2002 Angola"
- Mayhugh Travel (USA) "Astronomy Vacations"
- Open University (UK) "Astronomy Courses"
- Popular Astronomy (UK) "Membership"
- Jan Sladeczek (Czech Republic) "Solar Eclipse Journeys: My Experience"
- Peter Tiedt (South Africa) "Automated Eclipse Photography using Intel based computers for cameras equipped with an electronic cable release"

- John Tilley (UK) and Luca Quaglia (Italy) "Solar Eclipse Explorer"
- Roger Webb (UK) "The Solar Eclipse from the Antarctic"
- Val and Andrew White (UK) "Total Solar Eclipses of 2001 and 2002"

Sponsors SEC2004

In descending order of value:

- Open University Milton Keynes (UK)
- Anonymous 1 (USA)
- Rainbow Symphony (USA)
- Anonymous 2 (The Netherlands)
- Astronomy Vacations by Mayhugh Travel (USA)
- Jay Anderson (Canada)
- Friedhelm Dorst (Germany)
- British Astronomical Association Journal (UK)
- Explorers Travel (UK)
- EDP Sciences - Astronomy and Astrophysics (France)
- Dale Ireland (USA)
- Luca Quaglia (Italy)
- Michael Gill (UK)
- John Baterson (Ireland)
- Jeffrey Eccleston (UK)
- Bengt Alfredsson (Sweden)

Astronomy Courses Open University Milton Keynes

Jean Marc Lariviere (Canada) "Moving Eclipses - Eclipses in Films"

Abstract

From the early days of the cinematograph to the era of digital camcorders, scientists and amateurs alike have tried to immortalize the ethereal sights of the totally eclipsed Sun. After a brief historical survey of the first attempts to record totality, the discussion will move to a demonstration of the Eclipse Films Database (EFD), a Web catalogue of documentary and dramatic films that feature eclipses. Particular attention will be paid to the many ways eclipses have been used and depicted in feature films, sometimes to great dramatic effect, but mostly with very little attention paid to natural verisimilitude. Using clips from films such as *Barabbas*, where the crucifixion scene was shot during totality of a real eclipse, the animated *Tintin and the Prisoners of the Sun* and *Dolores Claiborne*, possibly the best use and most realistic depiction of an eclipse, the conference will be amply illustrated with video segments.

Biography

Born on January 31, 1955, in Hawkesbury, Ontario, Canada, Jean Marc Lariviere has been living in Toronto since 1976. After university studies in mathematics and physics, he de-

voted his time to writing, music and theatre. A self-taught filmmaker, his films have been shown in Canada, the United States and Europe. In 2000, the National Film Board of Canada released *LES CHASSEURS D'OMBRE / SHADOW CHASERS* his one hour documentary on eclipse chasers which was shown at the Solar Eclipse Conference 2000, in Antwerp. Shot over two years, in nine countries and four continents,



the film follows four eclipse enthusiasts from Canada, France, Switzerland and India during the August 11, 1999 total solar eclipse. As an amateur astronomer, he had observed a number of partial and annular eclipses, but this film project enabled him for the first time to witness total solar eclipses in Aruba (1998) and Austria (1999), along with the very deep annular in Australia (1999). He freely admits now being 'hooked on the shadow' and though he had to limit his recent eclipse activities to experiencing them vicariously through the travels and webcasts of his friend Olivier 'Klipsi' Staiger, he looks forward to being there in person for the total in 2006.

Babak A. Tafreshi and Hamid Khodashenas (Iran) "Shadow in the White Continent"

Abstract

Being among the first human to experience totality from cold-est, the most remote and one of the most beautiful continents of all, is just a fraction of what we really feel after observing 1 minute and 12.8 seconds spectacular totality. standing on the ice which covers part of Davis Sea in Antarctica and watching the eclipsed sun than 10 degrees over the frozen landscape.

Cruising with the Russian ice breaker, *Kapitan Khlebnikov*, we were wandering around the Davis Sea until the late sunset before the eclipse, searching for possible ways to south west, where the weather prospects seems to be better, though we were caught in well known unpredictable weather situation of the Antarctic.

The captain used data received by Fred Espenak through Jay Anderson in Canada. We stop on a pack ice area surrounded by icebergs in the horizon. The sky was mostly clear during our 4 hours night of no darkness, pink and yellow colors in the south-east Horizon promises a lovely sunrise of the great eclipse day. The first to be on the ice for the eclipse were probably couple of Adeili and Emperor penguins that were walking on the ice, enjoying the first sunrays of the day. Some of us who feel better standing on the ice for totality, left the ship and set our instruments on ice, and others stayed on the top of the icebreaker's bridge to watch the darkness of the shadow over the landscapes beneath.

As the first contact occurred, spreading dark clouds appeared

in southern Horizon, stay with us through the whole event. However most of what we anticipated has been experienced, penguins wandering around the observers for their curiosity, shadow over icebergs, amazing blue, yellow, green and orange colors of the horizon during totality, interesting Baily's beads and just glance of corona lasted just few seconds after second contact.

Even with high reflectivity of ice-covered area, it was unexpected dark, due to clouds which have covered most of the sky during the totality. The temperature was -8 at the sunrise and probably -18 at totality. Our observing location in middle of nowhere in Davis was coordinated at Latitude of -65 55 and Longitude of 89 16 E. Due to weather prospects and ice covered ocean, our observing site was way out of central part of the path but thanks to the exceptional wide path of totality we still got more than a minute of total solar eclipse, a minute that will last for ever for all the passengers aboard on this expedition.

They were more than 100 passengers on eclipse expedition with Kapitan Khlebnikov to Antarctica. They were from nearly 20 nationalities, some of them astronomers and experienced eclipse chasers, some others adventurers, and also tourist with interest to experience splendor of a total solar eclipse in one of the remote places on our planet. One of the documentary films made from this solar eclipse expedition prepared two Iranian eclipse chasers aboard Kapitan Khlebnikov. The documentary titled "Shadow in the White Continent" will be re-edit for an special short time edition to be shown on SEC 2004. It will cover the whole trip from Penguin rich southern Indian Ocean islands to the Antarctic coast and the eclipse day. Hamid Khodashenas is the producer of the film while Babak Tafreshi is the camera man, and scientific expert of the project.

Biography Babak A. Tafreshi

Babak A. Tafreshi was born in 1978 in Tehran, Iran. He is a science journalist and educator, an active amateur astronomer, nature and night sky photographer (www.dreamview.net) and editor at Nojum, astronomy magazine of Iran (www.nojum.net), where he has contributed over 60 articles on amateur and popular astronomy since 1997. He has studied Physics (B.C.) in Azad university of Tehran and as well as run-



ning diversity of outreach activities to promote astronomy popularization in Iran, he teaches astronomy to high school students in Zafarani educational observatory of Tehran.

Babak has also contributed astrophotography featuring Iran's landmarks and night sky to the US magazines, Sky and Telescope, Astronomy and Mercury. Well-versed in the many cultures, geography and archaeology of this complex country, he has led visitors to major tourist destinations but is best known for his trips off the beaten path. As an eclipse chaser he also chasing the shadow of the moon anywhere on the planet. He has observed the 15 seconds totality in 1995 from border of Iran-Afghanistan, then nearly 2 minute totality in 1999 from western Iran, 3 minutes 45 seconds totality from Kafue national park, Zambia in 2001, and over a minute totality in 2003 from Antarctica.

Babak A. Tafreshi - btafreshi@nojum.net

Editor at Astronomy Magazine of Iran (www.nojum.net)

Nature and Astrophotographer (www.dreamview.net)

Tel/Fax: 0098-21-8270029 (Nojum office)

Biography Hamid Djodeiri Khodashenas

Hamid Djodeiri Khodashenas was born in 1963 in Tehran, Iran. He is lawyer and an active eclipse chaser since 1999. His deep passion to observing eclipses of the sun leads him to found the first Iranian eclipse chasers group (www.shadow-chasers.net) called Sayeh (shadow in Farsi), where would be a place to promote interest to solar eclipse observation among Iranian amateur astronomers. He has observed 1999 totality from remote lake of Gahar in Iran and 2001 totality from Zimbabwe, 2003 totality from Antarctica.



Hamid Djodeiri Khodashenas - sayeh@shadow-chasers.net

Eclipse chaser and founder of Sayeh shadow chasers group (www.shadow-chasers.net)

Tel/Fax: 0098-21-2421090 (Sayeh office)

Daniel Fischer (Germany) "Getting your own AU with transits of Venus"

Abstract

In the 18th and 19th century transits of Venus drew astronomers on month- or even year-long expeditions, as observing those rare events from vastly different locations was thought to be the most promising approach to measure absolute distances and to get the precise absolute scale of the solar system. While the results were mixed and planetary transits have long been superseded by superior methods, there were still many attempts during the transit of Venus in 2004 to re-enact the old approaches or even to try new ones.

Most projects used the classical visual timing methods by Halley or Delisle, promptly running into the old problems of determining the exact instances of the 2nd or 3rd contact. Others tried to get the parallax of Venus relative to the Sun more directly from photographs. After reviewing some of these approaches the author will describe his own photographic attempt to measure the AU based on moderate-resolution photographs taken simultaneously in South Africa and Germany. A novel and remarkably simple method has been found to measure the Venus parallax from photographic pairs that does not even require knowledge of the orientation of the images, as sunspots come to the rescue.

Biography

Daniel Fischer is a science writer based in Koenigswinter, Germany, who publishes about everything interesting that happens in space, in books, magazines (including one published by him himself) and online, e.g. in *The Cosmic Mirror*, www.geocities.com/skyweek/mirror. Fischer, born in 1964, also travels around the world, usually in search of unusual sky phenomena: about 25 expeditions so far have led to 11 total and 6 annular eclipses, several meteor storms, three comets and one transit of Venus. On those tours, Fischer attempts to record the events with particularly simple and yet effective techniques.

Glenn Schneider (USA) "EFLIGHT 2003 - The Umbra on Ice from 35,000 ft"

Abstract

No total solar eclipse has ever been observed from Antarctica both because of the infrequency of occurrence and the logistical complexities associated with Antarctic operations. This paradigm of elusivity regarding Antarctic eclipses in the historical record of science and exploration is about to be broken. The next total solar eclipse, which occurs on 23 November 2003 U.T., the first in the Antarctic since 12 November 1985, will be very largely unobserved due to the geographic remoteness of the path of totality. Yet, interest in securing phenomenological observations of, and associated with, the eclipse by members of the scientific research communities

engaged in solar physics, astrodynamics, aeronomy and upper atmospheric physics, as well as educators and amateur astronomers has been extremely high. The development of a flight concept to enable airborne observations, with a dedicated aircraft chartered from QANTAS Airlines, will permit the previously unobtainable to be accomplished. To do so successfully requires detailed preparatory planning for the execution of such a flight. The technical groundwork to achieving this goal has been pursued with diligence over the past four years and is predicated on a legacy and computational infrastructure capability founded on more than three decades of eclipse planning for ground, sea, and airborne venues. Here, given the geometrical circumstances of the eclipse, the uncertainties associated with weather, and the constraints of op-

erations of the Boeing 747-400 aircraft, the requirements for the successful execution an intercept flight with the base of the Moon's shadow over the Antarctic are reviewed. The unequivocal need for real-time, in-situ re-computation of an executable flight plan in response to in-flight conditions is discussed. The mechanism for fulfilling that need, through the expert operation of EFLIGHT, a well-tested highly specialized software package of unique pedigree designed specifically for this purpose by the author of this report, working in concert with the flight crew on the flight deck is elaborated upon in the specific context of the requirements of this flight

Biography Glenn Schneider

Dr. Glenn Schneider holds a joint appointment at the University of Arizona's Steward Observatory as an Associate Astronomer, and as the Project Instrument Scientist for the Hubble Space Telescope's Near Infra-red Camera and Multi-Object Spectrometer. His research and instrumental interests are centered on the formation, evolution, and characterization of extra-solar planetary systems, and high contrast space-based (coronagraphic) imaging systems. His studies have focused on the direct detection of sub-stellar and planetary mass companions to young and near-by stars and the circumstellar environments from which such systems may arise and interact. In concert with his scientific investigations of circumstellar dust and debris disks and co-orbital bodies they may harbor, he has played a leading role in the development of very high contrast space-based coronagraphic and near-infrared imaging systems and techniques with HST, leading to spatially resolved scattered light images of nascent extraplanetary disks.

Dr. Schneider is a member of the International Astronomical Union's Working Group on Solar Eclipses with expertise in the high-precision numerical calculation of eclipse circumstances and the application of those computations in planning and carrying out observations of total solar eclipses. For more than three decades, Dr. Schneider has lead expeditionary groups and conducted such observations on land, sea and air of twenty-three (of the twenty-four) total solar eclipses occur-



ring since 7 March 1970 from remote locations across the globe conducting direct, polarimetric, and spectrophotometric imaging programs. Additionally, he has executed two, and planned five, high-altitude eclipse intercepts with jet aircraft.

Additional information on his background and research interests may be found at: <http://nicmosis.as.arizona.edu:8000/>

Biography Captain John Dennis

Joined Qantas in 1971.

Promoted to Captain Boeing 747-400 in 1990.

Have nearly 7000 hours in command of that aircraft alone.

Am responsible for the Qantas Antarctic flight programme (since 1995) and have flown 31 flights to date over Antarctica.

Trained John Travolta to fly the Boeing 747-400

Hold the position of a Senior Check Captain (responsible for training and checking pilots at all levels and rank).

Live in Sydney, married to Wendy with 2 sons, Matthew and Stephen

Operated the first, and only, promotional flight to Dublin in 1995.

Will be operating the first 747-400 charter flight into Cork in September.

And, obviously, flew the eclipse flight!!



John Dennis is the one in the right of the photo. He traded his QANTAS captain's hat for the eclipse cap for this flight!

Eckehard Schmidt (Germany) "Nuremberg - it's history of solar eclipses"

Abstract

Nuremberg houses the only national museum in Germany, the German National Museum (Germanisches National Museum). Its task is to preserve the knowledge of the art and culture of the German-speaking part of Europe. One of the manifold collections of the Nuremberg museum encounters the scientists with a collection of astronomical instruments, devices for time measurement, drawings and articles about solar and moon eclipses. 1050 Nuremberg mentioned for the first time in official documents. The base of the city richness was the understanding and developing of industry which includes handmade instruments. One aspect of the city development is the knowledge about astronomy. The astronomer Regiomontanus said: he lives at Nuremberg because the city is in the center of Europe, a place from where one can trade, exchange and travel around in all directions.

The first list of solar eclipses are from 1330/1343. Later on there are many documents with computed solar eclipses for Nuremberg or for other German parts. For example the eclipse from 17 June 1433 were predicted and observed. Solar eclipses from 1684, 1689, 1699 and 1706 were published by Georg Christoph Eimmart and Wurzelbauer.

Today the Nuremberg planetarium and the observatory continue in informing the public about astronomy and solar

eclipses. In the speech the main interesting details of eclipse history at Nuremberg are mentioned. It will be a bridge from history to present.

E. Schmidt, Betriebsrat Siemens, Nürnberg Moorenbrunn Gleiwitzer Str. 555, 90475 Nürnberg; Tel. 0911 895 2348; Fax 0911 895 3403; Homepage Betriebsrat <http://intra1.nbgm.siemens.de/br>



Biography

Eckehard Schmidt, born 1947, beginning with the hobby astronomy in boy time, skilled as an Electrician, later on I studied Computer Scientist, completing my Doctor-Ingenieur degree at the Technical University Berlin and working for several factories. Now I retired and live at Nuremberg /Germany/ and do what I wanted always to do travelling around and work for myself in the field of public science. More details see my homepage <http://www.wissenschafts-reisen.de>

Pierre Guillermier (France) "Eclipse Paintings in the XVIe and XVIIe century : The Pieter Paul Ruben's Christ on the Cross and the Antoine Caron's Dionysius the Areopagite"

Abstract

Although numerous accounts of eclipses are to be found in astronomical works, many others are scattered in a variety of writings or paintings. Painting is rich in references to eclipses. The investigation of this material adds an original dimension to astronomy by giving consistent and reliable source of information on variations in the terrestrial rate of rotation during the pre-telescopic period and to painting by specifying the life of the painter and the origin of the painting.

In this paper, for two works of art, we try to reconstruct the

date of the eclipse, discuss about the location and to link data coming from astronomical calculations with historical events.

Antoine Caron's Dionysius the Areopagite Antoine Caron painted Dionysius the Areopagite at the court of Catherine de Medici, Queen of France, who, like many rulers of the time, was extremely superstitious and fascinated by astronomical phenomena, often seeing eclipses and natural disasters as foreboding omens.

In the painting, astronomers gather in a town square beneath the shadowed Sun. In the background on the right, a statue representing Urania, the muse of Astronomy, stands on a

twisted column. Above, an ominous eclipsed sun glows and lightning streaks the stormy, cloud-filled sky.

The 9th of April 1567, a annular solar eclipse occurred. Did this event served as the subject of this painting by Antoine Caron? Might Antoine Caron observe the eclipse? What was the umbra's path during the eclipse of the 9th of April 1567?

Who reported the phenomena to Antoine Caron? Is Antoine Caron the author of this painting? Pieter Paul Ruben's Christ on the Cross

Rubens painted the triptych Raising of the Cross for the high altar of Antwerp's church of St Walpurgis. This triptych marked Rubens' sensational introduction of the Baroque style into Northern art. The artist had just returned from Italy, with the memory of Michelangelo, Caravaggio and Venetian painting still fresh in his mind. In the centre of the triptych, nine executioners strain with all their might to raise the cross from which Christ's pale body hangs. On the right, a Roman officer watches on horseback while soldiers in the background are crucifying the two thieves. In the sky, the Moon partially eclipses the Sun.

The 24th of November 29 AD, a total solar eclipse occurred. References to eclipses (both lunar and solar) upon the place of the Crucifixion are numerous. It seems this opinion takes its origin during the Middle Age. What source of information has inspired Rubens? What was the umbra's path during the eclipse of the 24th of November 29 AD? Does it exist other paintings representing eclipse during the Crucifixion?

This paper links some astronomical and historical elements. The writings and accounts, which have come down to us, are sketchy and enigmatic; we must exercise caution in their interpretation. Nevertheless, obeying the dictates of celestial mechanics, the Moon's umbral cone did indeed sweep across the Earth's surface. Our precise calculations confirm that. Solar eclipses allow dating with certainty human events.



Biography

Pierre GUILLERMIER is nuclear physicist. He has been interested in astronomy at 13 years old when he observed the Moon for the first time with a home made plastic lenses and cardboard "refractor".

Addicted with computing, he was one of the first to apply numerical treatment such as unsharp masking on eclipses photos to enhance fine corona structures. This work was published in Astronomy and Sky and Telescope.

He is also fascinated by ancient eclipses computing and considers eclipses as stopwatch able to date past human events.

Pierre is co-author with Serge Koutchmy (Institut d'astrophysique de Paris) of the book "Total Eclipses".

Rob van Gent (The Netherlands) "Early Examples of Eclipse Mapping"

Abstract

In many recent publications it is commonly asserted that the first printed maps depicting the path of totality of solar eclipses were made by the English astronomer Edmund Halley for the solar eclipses of 1715 and 1724.

In my paper I will present several earlier maps depicting the

partial and total phases of solar eclipses and discuss their origin and purpose.

Biography

Rob van Gent studied physics, mathematics and astronomy at the University of Utrecht and obtained his PhD in astronomy in 1989.



From 1989 to 1999 he was curator of astronomy at the National Museum for the History of the Physical Sciences and Medicine ("Museum Boerhaave") in Leiden.

He is currently employed as a research assistant at the Institute for History and Foundations of Mathematics and the Natural Sciences at

the University of Utrecht where he mainly works on the development of educational websites on Christiaan Huygens and the history of Dutch clock making.

His main interests are the history of astronomy, astrology, cartography, time-reckoning and related subjects.

For a list of publications, see <http://www.phys.uu.nl/~vgent/>

Chris O'Byrne (Ireland) "A calculator and timer for eclipse day"

Abstract

There are many good software packages for calculating eclipses.

EMapWin (http://www2c.biglobe.ne.jp/~takesako/cal/emapwin_eng.htm) and WinEclipse (<http://www.lcm.tuwien.ac.at/scs/welcome.htm>)

are two of the best free packages for the Windows platform. However, these packages are most useful for researching past and future eclipses - they do not fulfill many of the needs of the observer in the eclipse track on eclipse day.

In 1999, I started to try and write the best possible software package for the observer on the ground on eclipse day. The ideal package would work on a portable, lightweight, readily available and inexpensive computer that did not require complex power supply hardware. It would concentrate on calculating the details for one eclipse for a specific location on (or above) the Earth - details that would not only include the contact times, but also the direction of movement of the shadow across the observer's location, the distance and direction to the centre line, and the apparent direction of the moon across the sun's face. It would have audible and visual warnings of the arrival and departure of the moon's shadow - in particular, it would have a large easily visible countdown clock. Where possible, it would obtain the information it needed (latitude, longitude, altitude and time) from a GPS satellite navigation system. The targeted temporal accuracy for the software was to within one second.

Thus was born the eclipse calculator for the Psion Series 5 handheld computer - a package which has since evolved into the Javascript Eclipse Calculator, and which continues to evolve as computing hardware improves.

Biography

Chris O'Byrne became interested in astronomy as a child. At age 10, he learned that there would be a total solar eclipse crossing Europe on 11th August 1999, and he made a promise to himself to see that eclipse.

In the early 1980's, he was introduced to home computing, and has had access to a computer ever since. Graduating with an honours degree in Applied Physics from Dublin City University in 1990, he joined the Astronomical Imaging Group in the University of Galway with a view to getting a PhD. In 1994, he left the University of Galway (having not completed his studies) to become the first technical employee of Ireland On-Line, which quickly became Ireland's largest consumer ISP.



In late 1998, he contacted Astronomy Ireland, and was intro-

duced to Brian Seales, who was the primary organiser of Astronomy Ireland's 1999 eclipse expedition. And so, in August 1999, he observed his first total solar eclipse from the shores of the Black Sea in north-east Bulgaria with about 70 other members of Astronomy Ireland. Since then, he has helped Brian and the "ecliptomaniacs" to see the eclipses of June

2001 (Morombe, Madagascar), December 2002 (Folorodwe, South Africa) and May 2003 (Ackergill, Scotland). He has been a webmaster of the www.ecliptomaniacs.com website since its creation in January 2003. He presently works as a software developer for an out-of-home entertainment company.

Marcos A. Peñaloza-Murillo (Venezuela) "Radiative response of the sky and of the surface during the Solar Eclipse of 3 February 1916 at Tucacas and during the Solar Eclipse of 26 February 1998 in the Paraguana Peninsula on the Western Caribbean Coast of Venezuela"

Abstract

A complete and extensive scientific coverage required to observe and measure the ambient and atmospheric response of a partial and/or total solar eclipse, depends basically on the region of the Earth where this phenomenon takes place. Most part of the Moon's shadow generally falls over the sea. This means that on land it is unusual that it can pass over atmospheric observatories and meteorological station networks already in operation. In this situation, moving on to a particular site to make the observations implies difficulties in finding appropriate facilities, suitable equipment and restricts the type of measurements that can be made. Thus, the lack of additional and complementary observations can be worked out by the application of empirical models to a limited set of data instrumentally obtained which allows to analyse variables that otherwise could not be measured *in situ* during the eclipse. Under this approach, and considering some restrictive conditions, the radiative response of the sky and the surface of Tucacas during the total solar eclipses of 1916, and of Punta de Barco (Paraguana Peninsula) during the total solar eclipses of 1998, both sites on the western Caribbean coast of Venezuela, are studied, on a first approximation, using basic meteorological measurements of ambient temperature and relative humidity obtained at each site as the event was in progress. The radiative variables studied are the equivalent and effective emissivities of the sky, the irradiance and effective temperature of the sky, the ambient irradiance, and the irradiance and effective temperature of the surface. The results clearly show that this response depends on the time of the day in which each eclipse occurred. In particular, the radiative variables taken into account in the analysis were more influenced in the case of the Punta de Barco's eclipse, which took place in the first part of the afternoon, than that of Tucacas, which occurred at the end of the morning.



the Andes (ULA) at Mérida, Venezuela. At present he is a member of the Interdisciplinary and Interdepartmental Atmospheric Team of this faculty, and for many years he was a member of the early Astrophysics Group of this department of which he was one of their co-founders. His research cover an extensive and multidisciplinary area of interest, publishing many papers (in Spanish and English), ranging from History of Science and its relationship with society and religion up to environmental and atmospheric response to solar eclipses. Although his first two introductory research experiences with solar eclipses occurred several years ago (in the 1974 and 1991 solar eclipses), it was not until 1998 when he became seriously involved in solar eclipse research observing the last total solar eclipse of the twenty century for Latin America (26 February 1998) on the western Caribbean coast of Venezuela. Later on he was invited by the Romanian Institute of Meteorology and Hydrology to observe the last solar total eclipse of the past century from Bucharest (11 August 1999). Recently in 2001 he also could observe the first total solar eclipse of this century (21 June 2001) in Africa from University of Lusaka's campus, Zambia, invited to join the expedition of the Williams College-John Hopkins Observatory of Massachusetts. For these reasons he is the unique Venezuela citizen who, until now, has expended more time under the Moon's shadow.

He started his basic undergraduate studies in Physics in the Faculty of Science of the Central University of Caracas (UCV). Afterwards he continued his studies in this field at ULA where he got his first university degree as Licentiate in Physics with a minor in Astronomy and Astrophysics. Subsequently he took postgraduate courses in these two specialities in the aforementioned research group and finally obtained his PhD in the University of Essex, England, in the area of Atmospheric Physics with emphasis in aerosol optical properties where he currently research. With regard to the latter he also is involved in the reopening of the Mérida Atmospheric Research "Alexander von Humboldt" of ULA/FAV (Venezuelan Air Force) at Pico Espejo (Mirror Peak) in the "Sierra Nevada" of Mérida National Park (4765 m asl), the highest atmospheric observatory of its type in the tropics, to undertake, among others, a project to investigate the physical and chemical properties of the background aerosol of the Venezuela Andes and its influence in air quality, energy balance and regional climate change.

Biography

Dr. Marcos A. Peñaloza-Murillo is an Attaché Professor at the Physics Department of the Faculty of Science of the University of

Jean Paul Goddard and Martine Tlouzeau (France) "Eclipse Stamps and First Day Covers from 1942 till Nowadays"

Abstract

It all started in February 1999 during a diving stay on Bonaire Island (Dutch Caribbean). I entered the small Kralendijk post office to buy local stamps for my postcards and I got here my first eclipse stamps. The 1998 Total Solar Eclipse passed over the A B C Islands (Aruba, Curacao and Bonaire), then the Dutch Caribbean administration decided to issue a set of commemorative stamps.

As an eclipse chaser I thought it could be a good idea to collect eclipse stamps. I bought the full set and never stopped searching. It took me around four years to gather about 200 stamps, and Internet was a great help. I discovered that most eclipse chasers do collect eclipse stamps too and how easy it is to swap. Once I gathered all my eclipse stamps, I missed the searching hobby, so I decided to start a new challenge : collect the First Day Covers, maxi cards, souvenir sheets and phone cards...eclipse related!

All that stuff is presented on my web site (<http://mseclipse.free.fr>) "A rather extensive collection of eclipse stamps" Fred Espenak (NASA)



Biography

Martine works as Load Master for Air France at Charles de Gaulle Airport in Paris. She is involved with astronomy since the early 80. She founded and has been president of the CADRA (*Cercle Astronomique pour le Développement des Rencontres entre Amateurs*), one of the first association in the "French Minitel" virtual space.

Martine saw her first Eclipse in 1994 (ASE1994 from Madera Island) and then Brazil, (94), Guadeloupe (98), France (99), Zimbabwe (2001), Costa-Rica (2001), South Africa 2002. Martine discovered Diving with Jean-Paul and remains a "Concorde addict".

Jean-Paul is an IT engineer and is currently working as "Operational Risk Manager" in a French Bank. He saw his first Eclipse in 1961 in the centre of France, close to his birthplace. He travelled then in Thailand (95), Guadeloupe (98) where he met Martine "in the Moon's shadow", France (99), Zimbabwe (2001), Costa-Rica (2001), South Africa 2002 and Scotland 2003. Martine and Jean-Paul share lot of passions: Astronomy, Eclipse Chasing, Travels, Diving, Digital photo and video. They edit together different websites related to their common interests.



Jay Pasachoff (USA) "Science from eclipses and from the transit of Venus"

Abstract

I summarize scientific aspects of solar eclipses, starting with the Major discoveries about the sun made from them. I discuss the role of eclipses in contemporary solar research, given the presence of spacecraft such as SOHO and TRACE (NASA's Transition Region and Coronal Explorer). I show some recent results about the solar corona, and I describe the use of eclipses in collaboration with SOHO and TRACE to give more complete views of the corona than is available from any of them alone.

I also discuss our use of TRACE for observations of the June 8, 2004, transit of Venus, which is equivalent to an annular eclipse with 0.1% coverage. I Discuss the appearance and non-appearance of the black drop effect from TRACE and ground-based observations.

Biography

The Antarctic total eclipse of 2003 was Pasachoff's 37th and the South African partial eclipse of 2004 was Pasachoff's 38th solar eclipse. He is Field Memorial Professor of Astronomy at Williams College, Williamstown, Massachusetts, and Chair of the Working Group on Eclipses of the International Astronomical Union as well as President of the IAU's Commission on Education and Development. His recent books include "The Complete Idiot's Guide to the Sun" (Alpha Books, 2003) and, with Leon Golub, "Nearest Star: The Exciting Science of Our Sun" (Harvard University Press, 2001).



Ralph Chou (Canada) "Eye Safety: Transmittance data, reports of eye injuries, law suits and more"

Abstract

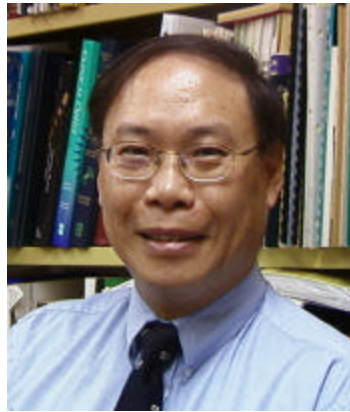
Since the last International Solar Eclipse Conference in 2000, several new solar filters have been introduced. Transmission data for these filters are presented.

The legal findings in a litigation arising from eye injuries sustained during the February 1998 total eclipse are presented. This case has important consequences for teachers who wish to include solar observations in their teaching of astronomy.

The controversy in Australia over the use of solar eclipse glasses during the total eclipse of December 2002 demonstrates the need for an international standard to regulate the manufacture and testing of these protective devices. Progress toward this goal is reviewed.

Biography

Dr. B. Ralph Chou is an Associate Professor of Optometry at the School of Optometry, University of Waterloo in Waterloo, Ontario, Canada. Dr. Chou's research is in the area of industrial and environmental eye protection, with special interest in analysis of, and protection from optical radiation and impact



hazards. He has been a consultant to industry and the Canadian government on eye protection against ultraviolet radiation, and published many articles on sunglasses and sun protection. He is well known for his work on the transmission properties of solar filters. He currently serves as Vice-Chairman of the Technical Committee on Industrial Eye and Face Protection of the Canadian Standards Association, Chair of the Safety Committee of the Science Teachers Association of Ontario, Academic Editor of the Canadian Journal of Optometry, and as a member of the Eclipse Information Committee of International Astronomical Union Commission 46. He has served on the executive and council of the Royal Astronomical Society of Canada, Toronto Centre since 1972, currently as Secretary and Observatory Director. An amateur astronomer for over 30 years, Dr. Chou has observed 14 total and 2 annular solar eclipses and led 9 eclipse expeditions.

Leo Dubal (France) "Questioning Ancient Eclipse Records"

Abstract

Among the bulk of the archaeological remains which have been considered - at one time or another - as relating a solar eclipse, contradictions are getting sharper between those "evidences", as the availability of new questioning tools develops.

The most selective tool we encountered so far might well be the "Pang's criterion" resulting from the analysis of all ancient Chinese eclipses:

If one writes the earth's deceleration as $D T = c \cdot t^2$, then the criterion is $27.5 < c < 32.5$ [s . cy ⁻²], with $c = D T \cdot [(1800\text{-year})/100]^2$

Another tool is the availability of the eclipses retro-prediction freeware EMAPWIN designed by Shinobu Take-

sako, which allies precision with ergonomics and which can be downloaded .

Special attention will be given to the annular solar eclipse over Thebes (E32.6°/N25.7°) at 16:41 LMT, on July 15th, 1360 BCE, as it might help to disentangle the chronology of the 18th dynasty.

Biography

DUBAL L é o, Swiss, born in Geneva, 1940, PhD University of Geneva, 1968, dubal@archaeometry.org

Professional Activities

Period, Organisation, Place

since May 00 vla (Virtual Laboratory for Archaeometry)

Soulages (F)

Apr 78 - Apr. 00 Swiss Federal Office of Energy Bern (CH)
Mai 73 - Apr 78 SIN (Swiss Inst. for Nuclear Research) Villigen (CH)
Sep 77 - Mar 78 Inst. Biomed. - ETHZ/UNI -ZH Zürich (CH)
Mar 77 - Jul 77 NIH (Nat'l Inst. of Health) Bethesda (Md.)
1976 - Mar 77 Dep. Radiology - Cantonal Hospital cantonal Basel (CH)
Aug 74 CEA-Saclay (Commission énergie atom.) Gif s/Yvette (F)
Mar 73 Lumonics, Inc Ottawa (Ont.)
May 71 - Feb 73 LBL (Lawrence Berkeley Laboratory) Berkeley (Calif.)
Apr 70 - Apr 71 CNRC (Conseil Nat. de Rech. du Canada) Ottawa (Ont.)
Mar 69 - Apr 70 DESY (Deut Elektronen-Synchrotron) Hamburg (D)
Jan 65 - Mar 69 CERN (European Center for Nuclear Research.) Geneva (CH)

Publications

- Particle Physics (33)
- Radiology & Health (13)
- Énergie (23)
- Refractory metals (1) & Decorative Arts (4)
- Semiology & Archaeometry (48)

Book : L'énigme des stèles de la Carthage africaine

Papers related to solar eclipses:

2003e: Adornos y Mascaras / L. Dubal
2003c: Dating Rock Art with Solar Eclipses ? / L. Dubal, S.
Koutchmy
2002j :
Pré-historias dos Eclipses / L. Dubal
2002i :
Eclipse totale sur Mavinga / L. Dubal
1998c
Astral Figures Typology, a Clue for Dating / L. Dubal
1995d :
The Riddle of the Protective Crescent in Punic Votive Art / L. Dubal



Exhibitions

"African Pictograms", with D. Seglie et al. Bernisches Historisches Museum, 16.1-29.3.1998
Bibliothèque municipale, Thonon-les-Bains, 29.4 -30.6.1998
"Traces de Carthage" : Bibliothèque Cant. & Univ., Lausanne, 6.5.-25.6.1999

Friedhelm Dorst (Germany) "Three Exciting Black Moons"

Abstract

One total, one annular and one partial solar eclipse of the past are portrayed here which have been of substantial meaning either in respect to permanent subsequent investigation at later eclipses or being a memorable example for good luck after a despairing day of permanent rain. The total eclipse of March 7, 1970 was the first total solar eclipse the author experienced, then 22 years old. The site decision finally focused on Mexico, some 15-road kilometres south of the village of Miahuatlan, federal state of Oaxaca. Extremely clear weather on eclipse day, never experienced on later eclipse trips, combined with a view distance of some 200 km were so overwhelming for that young beginner that the impact of the eclipse (being important from first until fourth contact) effected in a sudden "mutation" when considering priorities in my life planning ideas.

The eclipse photography resulted in successful earth-shine pictures comparable with those obtained by Mr. Peters & al. of Winnipeg Planetarium at the same eclipse. This remained my topic for many later total eclipses of the sun.

An annular eclipse of much surprise became that of May 30, 1984, which was observed from Morocco. Expecting to see also some chromospheric features a few seconds from second contact and after third contact I was fully unaware of detecting the lunar outline even some 1 minute before second contact. This coronal evidence became my favourite feature of interest when photographing annular eclipses.

Financial reasons let me omit the total eclipse of 1972 in favour of the big one of 1973. Western Germany could expect to see the beginning of a partial eclipse of the sun on July 10,

1972 instead. Eclipse day offered cruel some weather only with no hope of improvement until sunset. But the impossible did happen and a feeling of victory crowned that evening. Also a good lesson for beginners: Never give up!

Scanned photographs are displayed from CD illustrating each of the 3 eclipses along with photographic parameters in case of record.

Biography

Born on Dec. 8, 1947 in Castrop-Rauxel. Gymnasium from 1958 until 1966 in Witten. Studying Maths, Physics and Astronomy from 1966 until 1977 in Muenster, Germany. Teacher (Maths, Physics) in Witten since 1978.

First eclipse seen in my life: 30 June 1954 in Garenfeld, 82% magnitude in clear skies, having been 6 years old then. First eclipse expedition: March 1970 to the United States and Mexico. First (and so far only) lunar eclipse expedition: July 2000 to Australia.



Visit of three Mercury transits in Australia in 1986, 1993 & 1999. My favourite interest in practical Astronomy: Daylight observation of stars.

Mike Foulkes and Derek Hatch (UK) "Eclipse Imaging - 20 years of trying to improve"

Abstract

Like other eclipse enthusiasts, we both like to try to record images of totality and the partial phases of solar eclipses. Since observing our first total solar eclipses, we have progressively tried a variety of methods to get better images of these events, including using conventional photography coupled with photographic lenses and telescopes, video and more recently digital imaging.

In this talk, we will:

- * Discuss some of the techniques we have tried including the application of digital SLRs to eclipse photographs.
- * Present some of the results we have obtained.

Biography Mike Foulkes

Mike has been interested in astronomy from early childhood. He saw his first partial eclipse in 1968 and was immediately hooked but had to wait until 1983 until he saw his first total solar eclipse. So far been to 8 and like Derek has been very fortunate not to have been clouded out on any of them. Apart

from eclipses, Mike enjoys planetary observing. He is the Assistant Director of the British Astronomical Jupiter Section and over the last 10 years has co-authored many of the section observational reports. Mike is a project engineer within the communications satellite industry.



Biography Derek Hatch

Derek saw his first total solar eclipse from Kenya in Feb 1980. He has subsequently been to 7 total eclipses without failure. Derek is a keen amateur photographer and amateur astronomer. He owns a well equipped observatory and predominately observes the sun both in white and hydrogen alpha light, the moon and the planets. He was commissioned by the BBC to provide video images of the moon and planets for the "Heavens Above" TV series shown in 1994. His observatory also was

filmed for the Discovery Channel TV programme about the 1999 eclipse. Derek has worked in government service for 33 years and will be travelling to Antarctica to observe the total eclipse of the sun on 24 November 2003.

Mike and Derek have known each other since the early 1980s have collaborated together on a number of total eclipses and other astronomical projects. Their photographs of several total eclipses have appeared in a number of publications including Astronomy Now and the Journal of the British Astronomical

Association.



Nigel Evans (UK) "Flash"

Abstract

This presentation will briefly cover the history of the Flash Spectrum and the author's attempts at trying to record it for himself, using modest equipment. Finally the author will show some images of the Green Flash on a partially eclipsed Sun.

Biography

Dr Nigel Evans, Born 1954:

I have had a life long interest in astronomy, but never thought about actually seeing a total eclipse for myself. I believed that people who travelled a long distance for an event of just a few minutes were barking mad. However a chance conversation with my

cousin in 1982, who was on leave from his job in Indonesia, put me on my first long haul flight to see the 11th June 1983 eclipse from Surabaya, Java. Now, after 11 total solar eclipses, I just think we are alternatively sane!

As I enjoy astronomy, photography and travel, eclipse chasing conveniently combines all three together. In the latter years I have tried to automate the recording of the eclipse, with varying degrees of success.



I am currently a Project Engineer for BT in East Anglia.

Jay Anderson (Canada) "2005 and beyond - a look at eclipse weather prospects for the next five years"

Abstract

Location, location, location - the three most important factors in selecting a viewing site for a solar eclipse - are largely determined by the cloud climatology of the regions along the eclipse track. Some eclipses, such as those over India in 1995 and Turkey in 1999, were blessed with high probabilities of clear skies and few observers missed the event. Others, such as the total eclipse of 2009, have poor climatological prospects and require careful planning to increase the chances of

success.

This presentation will discuss the climatological prospects for the years from 2005 to 2010 for the eight central eclipses that will occur during that interval. Cloud cover maps and local weather statistics will be used to suggest the best observing sites, but the discussion will also focus on limitations and biases in the climatological statistics, chase strategies, and suggestions for taking advantage of local topography.

With the development of long range forecast models, some going as far as fifteen days into the future, eclipse site selection takes on a new dimension. The ability to move from one site to another several days in advance of the eclipse in response to the cloud predictions of a computer model can be of considerable benefit, but the models must be used very carefully. Eclipse travellers can change their strategy from a single fixed site to one with more allowance for mobility in response to numerical predictions. The presentation will also discuss the limitations and benefits of numerical forecast models, and the ways in which they may be used by eclipse travellers.

Biography

Jay Anderson is a senior meteorologist with the Meteorological Service of Canada and co-author of the NASA Solar Eclipse Technical Publications with Fred Espenak. Jay graduated from the University of British Columbia in 1973 with a degree in Physics and Astronomy, but his attention turned immediately to meteorology and a career with the Government of Canada as a forecaster. In his three decades as a meteorologist he has worked primarily at Winnipeg, on the Canadian Prairies with a three-year hiatus in Vancouver. In his career

he has been employed as a public forecaster, a satellite meteorologist, as a trainer, a severe weather meteorologist, marine forecaster, mountain weather forecaster and an aviation forecaster. In his current role, he is manager of the Warning Preparedness Program for central Canada and a supervisor at the Prairie Storm Prediction Centre in Winnipeg.



Jay has published papers on thunderstorm forecasting, the meteorology of solar eclipses, marine winds and various forecasting procedures. In his spare time he is an amateur astronomer with a liking for astrophotography, solar eclipses and eclipse travel. He first published a climatological study for the 1979 total eclipse and shortly thereafter became a regular contributor to the Eclipse Circulars published by the US Naval Observatory in Washington. When the USNO ceased publication of these circulars, Jay joined with Fred Espenak to continue the publication of eclipse data under NASA auspices. In all, Jay has travelled to a fourteen central eclipses and written climatological summaries for many more.

John Tilley (UK) and Luca Quaglia (France) "Solar Eclipse Explorer"

Abstract

This session is a demonstration of some of the features of SEE (Solar Eclipse Explorer). SEE was initially written by John Tilley, an exchange of emails with Luca Quaglia led them to join forces in February 2004. SEE displays a list of all solar eclipses from -10000 to +14000 (ie twenty four thousand years). The original source for this list was the JPL long ephemeris from -3000 to +3000. Luca used the core of the numerical integrator Solex, described and implemented by Aldo Vitagliano and kindly supplied by him, to write his own integrator. Its output is highly precise (it's very close to the DE406) and allowed him to widen the time span of the availability of the Besselian elements outside the interval [-3000,+3000], keeping the same precision as Emapwin.

SEE displays eclipses in one of three ways:

- 1) - Chronological list - you can click on a date to draw the corresponding eclipse map. You can build your own list to display eclipses that you have selected.
- 2) - Digitally on a globe of the world. You can interact with the map, get local circumstances and zoom in to see detail down to a few kilometres.

- The mapping used is currently "Digital Chart of the World" and the layers supported are coastal and political boundaries, built-up areas, roads, rivers, lakes and contours. We plan to change to VMAPO -as DCW is missing some data in the north polar area.

3) - In a Saros-Inex panorama after G van den Bergh. You can select a saros or inex and cycle through all the eclipses in the cycle, the eclipse maps being digitally drawn on the globe described in 2) above. It was an analysis of the strange behaviour of Saros 0 that led John and Luca to exchange emails and to join forces.

SEE provides full information on all solar eclipses - including the "Meeus Type" - see Mathematical Astronomy Morsels for the seven types of solar eclipse map (Pages 62-82). As you cycle through a saros or inex you can see the transition between the different types.

SEE can display single or multiple eclipses - so you can display all eclipses for a given Saros or the five total Egyptian eclipses from Meeus' "More MAM". SEE will autodraw eclipses - ie set it to draw one eclipse after another. You can display and analyse the saros-inex patterns described by van den Bergh in his classic work "Periodicity and Variation of Solar and Lunar Eclipses" - namely stalactites, stalagmites and hayforks. It is interesting to see how

these change outside the period of his work (which was based on Oppolzer's canon) - particularly the overall shape of the panorama. We believe these changes may be due to the changes in eccentricity in the Earth's orbit - but haven't yet proved this.

Work in progress includes:

- adding support for van den Bergh's "Compass Card" - this is an excellent way to look at patterns of Annular, Annular-Total and Total eclipses in the saros and in ex.

- adding support for a saros-inex panorama of lunar eclipses.

- adding an analysis function for analysing numbers and type of eclipse by century and producing graphs and statistics.

Improving the way of building a list of eclipses for a given place (ie point) - by combining several such lists you can build a list of all eclipses for a given country. Work in progress includes automatically choosing the points for any given country - you can then display this list and move backwards and forwards in it.

Biography

John Tilley graduated from Trinity College, Cambridge with an honours degree in Mechanical Sciences in 1969. He never became an engineer, having already set his mind on a career in IT. He decided to take a two-year gap before finding a job in IT. <well before "Gap Years" were common>. He spent the next 15 months in Tokyo, studying "Igo" (the Oriental board game - often called "Go"). He wrote several magazine articles and a small book "Go: International Handbook and Dictionary". He then spent six months traveling back to the UK overland, during which time he spent six weeks trekking in Nepal and two weeks traveling in central Afghanistan. He has subsequently climbed in both the Alps and Himalaya.

His many interests include good food and wine, maps, astronomy, mountains and hill walking, Sumo and sushi, Real Ale, mathematical recreations, computers, Go and do-it-yourself - the latter being necessary as the house he and his wife live in was built before the

annular eclipse of 1547.....

He now works for IBM where he manages Technical Sales and Support for database products across EMEA.

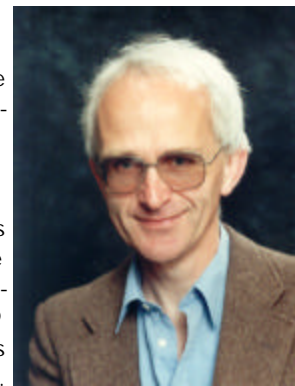
John's life-time interest in maps and astronomy inspired him to write a few lines of code to produce a digital eclipse map of the August 1999 eclipse, using the path co-ordinates from Fred Espenak's web-site.

Somehow this got a life of its own and six thousand lines of code later, plus a lot of research resulted in Solar Eclipse Explorer.

Luca Quaglia was born in 1973 in a small village of Northern Italy, in a quiet region located between Lake Maggiore, the Lake of Como and the Prealps. He graduated from Politecnico di Milano, Milan (Italy) with a Master Degree in Nuclear Engineering in 1999 and obtained a Ph.D. in Physics from Université Paris XI, Orsay (France) at the end of 2001.

His research field was the interaction between strong laser and matter; more precisely between femtosecond laser pulses and molecules. He published four articles in international scientific journals and took part in international conferences.

He loves admiring the starry sky and sharing its poetry with others. Loving mathematics too, he has always been very interested in the mathematical aspect of astronomical phenomena, mainly solar eclipses.



Serge Koutchmy (France) "Towards a higher spatial resolution in coronal total eclipse imaging"

Abstract

It is known for a long time that the solar plasma-corona contains many different-scales structures. The recent space-borne TRACE -images taken in selected coronal emission lines confirm that the corona is highly structured, mainly above active regions where usually the magnetic field largely dominates. Quiet regions and especially coronal holes are more difficult to image in X-EUV light. Conversely, W-L images do not show a contrast as high as emission lines images. They better

show the faint corona, including the more outer regions (intermediate corona), where TRACE could not show nothing. The expensive X-rays telescopes could eventually show a large part of the intermediate corona but long exposure times are needed and it is not clear, what is seen in coronal holes. Accordingly, W-L images of high-spatial resolution would represent a very good diagnostic of the magnetic corona and eclipses are good opportunity to perform it. The recent methods widely used by Amateurs to observe the Moon and planets should now bring new advances in fast coronal imaging.

It is mainly based on the use of low-cost digital Webcams connected to fast laptops and, also, of large format digital CMOS and CCD reflex cameras with 6 Mpx chips. We will remind what has already been done with more conventional detectors at the focus of the largest 3.6 m aperture CFH telescope used at the 1991 eclipse. Topics where Amateurs could now concentrate their attention and interest will be discussed:

- * Improving what has been done up to now on a large field;
- * Analysis of the faintest sub-arcsec coronal features using the fast imaging;
- * Time sequences of very small scale dynamical phenomena;
- * Improving the seeing during the totality by observing in the near IR.

A simultaneous observation of faint coronal details and of a background bright enough known star could be the ultimate for producing photometric quality observations.

Biography

Born in Le Creusot- Saône et Loire (France 71), married, 2 Children. Currently at: Institut d'Astrophysique de Paris (CNRS) 98 Bis Bd Arago; F-75014 Paris (France) phone: 33144328056; Fax: 33144328001; e/mail: koutchmy@iap.fr

Education:

1952-58 Ecole Spéciale Schneider (B.T.); Le Creusot-France
 1959-63 State University Moscow-Russia
 1963-1967 Orsay (Fr) University, Master degree in Physics
 1967-68 Military service
 1972 PhD Paris 6 on "Coronal Streamers Physics" Positions:
 1968 Assistant Paris Observatory
 1968 Research fellowship Centre Nat. de la Rech. Scient.(AR)
 1978 Permanent position at CNRS (CR1)

1992- now: Directeur de Recherche (DR2) at CNRS(France)
 Fellowship/Awards: AFGL/Sacramento Peak Observatory-NM (USA) 1976-78 and 1986-88 . Honors: Medals of the French Space Agency CNES (1983) and of the Russian Space Agency (1982); Medal Janssen, French Academy of Sciences (1993); Price Janssen of the French Astronomical Society (1998); inclusion in the Marquis Who's Who in the Word, 20th ed, 2003.

Selected Activities:

*Observed 16 TSE at ground, over seas, using aircrafts (incl. the Supersonic Concorde 001) and in space; models of F-

corona and of coronal structures; spectra and polarization analysis;

*Developed several solar IR experiments at Pic du Midi Obs. 1st absolute measurements of solar intensities at 18 to 24 microns- 1968; 1st sunspot photometry at 3.75 microns

*Developed IR photometry at the Sacramento-Peak Obs. VTT (1977) over the granulation;

*Developed a prominence magnetograph on the largest existing coronagraph- 53 cm aperture- of the Kislovodsk High Altitude Observatory (1980-82);

*P.I. of the spaceborne experiment 'Night Sky Imaging' for the flight of the 1st French Spationaute on Saliout 7 (1982); co-I of PIRAMIG;

*Developed the 1st mirror coronagraph at NSO/SP (1987); 1st optical coronal image ever made with a mirror coronagraph;

*Co-I of the C2/Lasco coronagraph of SoHO (1988); design of the SWATH space-borne mirror coronagraph; co-I on the Solar Probe coronal experiment (2000)

*P.I. of the CFHT-91 eclipse coronal experiment on Mauna-Kea to point the largest optical telescope ever used toward the Sun; best resolution ever achieved of an image of the W-L corona; movie of a coronal plasmoid;

*Performed 1st observations of SXR polar jetlets on Yohkoh-96 at ISAS-Japan; spicule studies;

*Performed 1st measurements of the solar prolateness at NSO/Sacramento-Peak Observatory (1997-98) using coronagraphs and the VTT (DST);

*1st measurements of the Compton effect over linear rays of the solar corona (2002-2003).

Publications: more than 400 scientific papers published from 1967 to now; Books:

* "Total Eclipses", 1998, Masson Ed. 280 pp (French); re-edited in 1999 and translated (English) at Springer-Praxis Series in Astron.(1999); translation in other countries.

* "African Eclipses", 2002, 78 pp., Lineale Ed.

* Participation as invited contributor and/or chairman in the writing of 7 books, like the Illust. Solar Glossary - Riedel Pub.(1978) and the Astron. Astrophys. Encyclopedie (2000).

5 Selected papers by S. Koutchmy, over 35 years



Tom van Flandern (USA) "View from the edge: The special phenomena that make totality so spectacular"

Abstract

For 200 years, astronomers incorrectly assumed that most interesting solar-eclipse-related phenomena would be maximized on the eclipse centerline. In the 1960s, with the rise in

interest in observing grazing occultations of stars by the Moon, several astronomers realized that such grazing conditions provide an observational advantage. The first eclipse where astronomers deliberately went to the edge for a better view was in 1970, which exceeded expectations. But edge

John Parkinson (UK) "A Sideways Look Back at the 1999 Eclipse in the UK"

Abstract

With mainland Britain not having experienced a total solar eclipse since 1927, the 1999 event was eagerly awaited. Everyone knew about it and most of the population experienced it in some way; hundreds of thousands went to south west England and over 13 million people watched it on BBC TV.

This talk looks at how the event was anticipated and reported by newspapers, exploited by advertisers and celebrated by cartoonists - a curious legacy that researchers will rediscover in the run up to the 2090 eclipse!

Biography

John Parkinson has been studying the sun for over 35 years, particularly the corona. He developed unique instrumentation for flights on rockets and satellites that gave unique insights into the thermal structure of the solar atmosphere.

Intrigued by the "shrinking sun problem" his interest in total eclipses started 25 years ago when he realised they provide the only reliable method of regularly measuring the solar diameter. Since then he has led expeditions all over the world

preferring to observe from remote and peaceful locations.

John is always in demand by the media and was heard around the world shortly after the recent eclipse in Antarctica. He was the subject of the BBC TV documentary "Shadow Chasers" and was their lead scientist for the live coverage of the 1999 eclipse.

John is presently Professor of Astrophysics at Sheffield Hallam University in the UK.



Fred Espenak (USA) "Eclipse Predictions for 2005 and Beyond"

Abstract

A brief overview of solar eclipses from 2005 through 2010 will be presented. Global maps illustrate the geographic region of visibility for each eclipse. Some of the more significant events of this period will be discussed in greater detail.

Of particular interest will be the total eclipse of the Sun on 2006 March 29. It be visible from within a narrow corridor which traverses the Eastern Hemisphere. The path of the Moon's umbral shadow begins in the South Atlantic, crosses northern Africa, the eastern Mediterranean, Turkey, central Asia and ends at sunset in northern Mongolia. A partial eclipse

will be seen within the much broader path of the Moon's penumbral shadow, which includes most of Africa, Europe and western Asia.

Detailed predictions for this event have recently been published in NASA 2006 Eclipse Bulletin (Espenak and Anderson, 2004). Topics covered include besselian elements, geographic coordinates of the path of totality, physical ephemeris of the umbra, topocentric limb profile corrections, local circumstances for several hundred cities, maps of the eclipse path, weather prospects, the lunar limb profile and the sky during totality.

The NASA eclipse bulletins are prepared in cooperation with

the Working Group on Eclipses of the International Astronomical Union and are provided as a public service to both the professional and lay communities, including educators and the media. The bulletins are also available on the Internet via the GSFC Solar Data Analysis Center home page (umbra.nascom.nasa.gov/eclipse/). Additional predictions, maps and data are posted at a special web site for the 2006 eclipse (sunearth.gsfc.nasa.gov/eclipse/TSE2006/TSE2006.html).

Biography

Fred Espenak is an astrophysicist at NASA's Goddard Space Flight Center in Greenbelt, Maryland, where he uses state-of-the-art infrared spectrometers to probe the atmospheres of the planets. This work frequently takes him to the world's highest observatories atop the Hawaiian volcano Mauna Kea. He has participated in a number of research projects including the monitoring of ozone in Mars' atmosphere, the detection of winds on Venus, Mars and Titan, and the measurement of hydrocarbons in the stratospheres of Jupiter, Saturn, Uranus and Neptune.

Espenak is perhaps best known for his predictions of eclipses. His two books, "Fifty Year Canon of Solar Eclipses: 1986 - 2035" and "Fifty Year Canon of Lunar Eclipses: 1986 - 2035" have become standard references on the subject. Espenak also

publishes special NASA bulletins for each major solar eclipse which provide detailed predictions and maps. He is co-author of the popular book "Totality: Eclipses of the Sun" with Mark Littmann and Ken Willcox. Espenak's interest in eclipses was first sparked after witnessing the total solar eclipse of March 1970. Since then, he has participated in over twenty eclipse expeditions around the world and has made predictions on thousands of eclipses. His astronomical photographs have appeared in both national and international publications, and he has lectured extensively to the general public on science, eclipses and photography. He is also the webmaster of NASA's official eclipse web site (sunearth.gsfc.nasa.gov/eclipse/) as well as his own personal web site on eclipse photography (www.MrEclipse.com). In 2003, the International Astronomical Union honored Espenak by naming asteroid 14120 after him.



Vojtech Rusin, Milan Minarovjeh (Slovakia) and Miloslav Druckmuller (Czech Republic): "Image Processing"

Abstract

The white-light solar corona has a very steep gradient of its intensity, especially in its most inner part, where also very faint, complicated structures, created and maintained with the magnetic fields, are located. To overcome this problem and to get a very high quality pictures for study of individual coronal structures, several snapshots with different exposures are taken during the total solar eclipse, or a radially-graded filter is used. We will deal with a new method of image data processing in this contribution.

Solar corona image processing, taken during the total solar eclipse, consists of two basic steps. The first one is a registration of coronal images taken with different exposures. This

registration is of great importance because its precision determines the resulting image resolution. The most contrast feature in the corona images - the Moon, can't be used because of relative fast its motion during the total eclipse. Therefore, faint coronal structures must be used. A special modification of phase correlation method computed by means of the Fourier transformation was developed for image registrations which enables us to measure the rotation-scaling factor, and so to compose individual snapshots with the very high precision. The second basic step is a visualization of coronal structures which are for human vision invisible because of low contrast. A new method base on adaptive (variable) kernel convolution was developed. This method enhances coronal structure in high spatial frequencies without of edge effects. The frequency characteristic may be set with changing of several parameters in the wide range. Instead of present widely used

method of radial masking, the new developed method enhances structures in all direction and not only in the radial ones. Obtained results are better or comparable with those of used radial graded filter, however, with less complication during the short period of observation. Examples of several white-light corona pictures will be demonstrated. We note, the white-light corona is missing in the SOHO observations to 2 solar radii.

Biography Miloslav Druckmüller

Prof. RNDr. Miloslav Druckmüller,
CSc. ♂ 24th September 1954 in
Brno, Czech Republic



I was studying mathematics at the Masaryk University in Brno and finished my studies of master degree in 1978. Since 1979 I have been working at the Brno University of Technology, Faculty of Mechanical Engineering, Institute of Mathematics, in the period of 1979-1983 as an assistant, 1983-1995 as a chief assistant, 1995-2001 as an associate professor and since 2001 as a professor. Since 2003 I have been the chief of department of Applied Algebra and Geometry. My specialization is digital image processing and image analysis, multi-valued logic, fuzzy set theory and applied algebra. I am an amateur astronomer. My first successful total solar eclipse expedition I organized in 1999. Since that I have been continually developing software for processing of solar corona images. The first result of this work was the CD called "Journey to the Solar Eclipse" published in 2000 (<http://www.zatmenislunce.cz/edefault.htm>). One year ago I started a project together with Úpice Observatory in the Czech republic and the Slovak Academy of Sciences the aim of which is to create an archive of high quality processed images of total solar eclipses taken during last 15 years. First results of this project are available on the web site: <http://www.zam.fme.vutbr.cz/~druck/Eclipse/Index.htm>.

Besides astronomy my hobbies are photography and mountain climbing. I was a member of several expeditions to Himalayas, Andes, Pamir, Kamchatka, Svalbard etc. My highest mountain I have successfully climbed is Huascarán in Cordillera Blanca (Peru) 6768 m 22205 ft. I am married and with my wife Zuzana I have two daughters Hana (18 years) and Zdena (16 years). The common interest of our family are mountains. My wife Zuzana and me published a book of mountain photography and multimedia CD, both called "From Huascarán to Everest".

Biography Vojtech Rusin

Born: 7 January 1942 at Spišské Hanušovce, beautiful place at Slovakia, close to Dunajec river

Graduated: 1970 -
Comenius University,
Bratislava; DrSc. -1994 -
Slovak Academy of Sciences,
Bratislava



Profession: Astrophysics-solar physics, at Astronomical Institute, Slovak Academy of Sciences, 059 60 Tatranská Lomnica, from 1959

Area of research: Physical and dynamical properties of the solar corona, both the white-light eclipse and non-emission eclipse, and prominences; time-latitudinal distribution and temporal development of the corona and prominences over solar cycles, the emission line coronal oscillations. Head of the 13 solar eclipse expeditions, from 1973, Niger (1973), India (1980 and 1995), Soviet Union (1981 and 1991) - today Russia, Indonesia (1983), Mexico (1991), Chile (1994), Mongolia (1997), Venezuela (1998), Turkey (1999, connected with the earthquake), Zambia (2001) and South Africa (2002). Two eclipses: Russia (1991) and Mongolia (1997) were double covered - with the Moon and clouds, accompanied with raining and snowing. Results concentrated in more as 200 scientific papers, and two books.

Hobby: Photography and astronomy popularisation. Many articles written in Slovak language. Slides used for journals, calendars, etc.

Married: To Anna, 2 sons, grandfather at the moment

Other remarks: In 2002, the International Astronomical Union honoured Rusin by naming asteroid 26390 after me. In 1979, the first and only one ground based observation of the sun grazing comet 1979X1 residue in the emission corona obtained with me at Lomnický Štít coronal station. I spent at the Lyot type coronagraph for more than 25 years

F. Richard Stephenson (UK) "Historical eclipses: then and now"

Abstract

This talk will be concerned with solar and lunar eclipses observed between about 700 BC and the start of the telescopic era. Despite the loss of much material down the centuries, numerous records of eclipses are preserved in the history from this long period. These originate from four major cultures: ancient Babylon, ancient and medieval China, ancient and medieval Europe, and the medieval Arab dominions. Still earlier allusions to eclipses (some before 1000 BC) can be traced -- especially in Chinese history -- but these are rare and dating is difficult.

Early eclipse records, whether of the Sun or Moon, can be grouped into two main categories: (i) those reported by astronomers: and (ii) those noted by chroniclers, etc. Astronomers often made careful measurements of contact times and made estimates of eclipse magnitudes. As might be expected, chroniclers and other non-astronomers tended to concentrate instead on more qualitative aspects. However, they often described total solar eclipses in graphic detail.

In the first half of this talk, examples will be given of the various types of eclipse observation which are preserved. The problems of accessing the various historical sources and dating the individual texts will also be briefly discussed.

Eclipse observations provide the only viable data for investigating changes in the Earth's spin rate in the pre-telescopic period. The second half of the talk will be largely devoted to the application of these early observations (both timed and untimed) to the determination of variations in the length of the day.

The talk will conclude with a brief discussion of the accuracy with which ΔT can be determined in the ancient and medieval past, a problem of some significance to those concerned with the history of astronomy.

Biography

Biography from the WebPages of the University of Durham, UK

http://www.dur.ac.uk/physics/general/staff_pages/

[physics_staff_frs.php](#)



Prof F. Richard Stephenson, Qualifications: BSc, MSc, PhD, DSc, FRAS, Position: Professorial Fellow

Teaching duties: 1st Year History of Astronomy (Astronomy for All) 2nd Year Physics and Society 3rd Year Tutorials 4th Year Project Supervision Research Interests: Applied Historical Astronomy: Eclipses and Earth's Rotation, Historical Supernovae, Solar Variability, etc. Room: 108, Telephone: 0191 3742153, E-mail: f.r.stephenson@durham.ac.uk

Publications: Departmental list 1995-2000

<http://www.dur.ac.uk/Physics/research/publications/inspect.php3?author=Stephenson>

Search of departmental publication database for "Stephenson" ...

Publications for 2000

- Simultaneous auroral observations described in the historical records of China, Japan and Korea from ancient times to AD 1700, *Annales Geophysicae* 18, 1-10;
- Historical eclipses and the Earth's rotation, *Science Progress* (millennium edition) 83, 55-76;
- A lunar occultation of Mars observed by Aristotle, *Jl. Hist. Astr.* 31, 341-344;
- Solar and lunar eclipses in early Korean history, *Proceedings of the Third International Conference on Oriental Astronomy* (ed. Masanori Hirai). Fukuoka University Press, Japan, 103-109;
- Il calendario cinese, *L'Astronomia*, No. 208: 30-39.

Publications for 1999

- The Babylonian first visibility of the lunar crescent: data and criterion, *Jl. Hist. Astr.* (30), 51-72;
- The supernova of AD 1181 - an update, *Astronomy and Geophysics* (40), 2.27-2.28;
- The earliest drawing of sunspots, *Astronomy and Geophysics* (40), 6.21-6.22;
- Early Chinese observations and modern astronomy, *Sky and Telescope*, (97), no. 2, 48-55;
- Perfect timing, in *Total Eclipse*, ed. N. Scott, Highbury House Communications, London, 22-23;
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- Historical Eclipses and the Rotation of the Earth, *Phys. Chem. Earth* 23, 715 - 724;
- The Chinese calendar and its operational rules, *Orion* No. 286, 16-20;
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- Conversion of the Chinese cyclical calendar into the Julian or Gregorian Calendar and vice-versa, *Orion* No. 289, 11-15;
- Eclissi storiche, *l'Astronomia* No. 187, 38-47;
- Star maps of the ancient orient, *Yearbook of Science and the Future*, 1999. *Encyclopedia Britannica*, Chicago 54-69;
- The sands of time and tidal friction, In *The Message of the Angles - Astronomy from 1798 to 1998*, ed. P. Brosche, Verlag H. Deutsch, Frankfurt am Main, 100-113.
- Historical eclipses and earth's rotation, Cambridge University Press, 557;
- (ed.) *Oriental Astronomy from Guo Shoujing to King Sejong*, Yonsei University Press, Seoul, 401;
- Solar and lunar eclipse measurements by medieval muslim astronomers, II: observations, *Jl. Hist. Astr.*, 28 29-48;
- Records of lunar eclipses in medieval arabic chronicles, *Bull. Sch. Or. Afr. Stud.*, 60 1-34;
- Lunar eclipse times predicted by the Babylonian, *Jl. Hist. Astr.*, 28 119-131;
- Contemporary geophysics from Babylonian clay tablets, *Contemporary Physics*, 38 13-23;
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- contributions on Eclipses, Lunar mansions in Chinese astronomy, Celestial East Asian maps, *Encyclopaedia of the History of Science, Technology and Medicine in non-Western cultures* (ed. Selin, H.) Kluwer, Dordrecht, 275-277; 516-518; 562-565.

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- Accuracy of Lunar Eclipse Observations made by Jesuit Astronomers in China, *Jl. Hist. Astr.* (27) 61-67;
- Comparison Between Oriental and Accidental Sunspot Observations, *Q. Jl. R. Astr. Soc.* (37) 189-229;
- Solar and Lunar Eclipse Measurements by Medieval Muslim Astronomers I: Background, *Jl. Hist. Astr.* (27) 259-273;
- Auroral Observations on A.D. 1770 September 16: The Earliest Known Conjugate Sightings, *Q. Jl. R. Astr. Soc.* (37) 733-

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- Modern Uses of Ancient Astronomy, Astronomy Before the Telescope, (ed. Walker, C.B.F.) British Museum Publications, London, 329-341.

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- The Babylonian unit of time, Jl. Hist. Astr., (25) 99-110;
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- Long-term fluctuations in the Earth's rotation: 700 B.C. to A.D. 1980, Phil. Trans. Roy. Soc. A, (351) 165-202;
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Last Updated: 21st Mar 2001 - f.r.stephenson@durham.ac.uk

Peter Hingley (UK) "Picturing Eclipses; 500 years of Eclipse Imagery"

Abstract

The pre Eclipse frenzy which gripped England in 1998/1999 led to many requests for images for exhibitions, articles and the like. A large file of reference material was assembled to facilitate answering these enquiries and further work has been put into the collection since. The talk includes some of the funny and sad stories of eclipses and the many subjects to which this material can be relevant; showing how historical illustrative material can illuminate past attitudes to the Universe and be exploited to encourage an interest in Science in general. The date span of the images mentioned in the title is 1472 to 1999, but this is liable to increase without notice !

Biography

Life and Hard Times

Peter D Hingley is a native of the village of Pedmore, near Stourbridge, Worcestershire, and was born in 1951. He is descended from long lines of Black Country ironworkers and Staffordshire and Shropshire yokels, a fact of which he is inordinately proud. The patronymic was originally of Huguenot origin, and the 'family' ironworks, Noah Hingley and Sons, made

chain cable and anchors for many great ships worldwide, most famously the tragic 'Titanic'.

He attended the now destroyed King Edward VI Grammar School, Stourbridge, and came under heavy paternal compulsion to study science rather than the literary and historical subjects for which he had some aptitude.

As he was and is 'mathematically challenged' this was rather a bad idea and after various vicissitudes he managed to stagger out of Lancaster University in 1973 with a fairly poor degree in Environmental Sciences. Having met several agreeable and civilised librarians he decided on this as a career in the belief that it would enable him to work in nice remote country places and to escape from science into subjects he was actually interested in. Achieving his usual success rate in this he first secured employment in Piccadilly, London, W1, in a Learned Society library (The Society of Antiquaries of London) specialising in history and archaeology and six years later was fortunate enough to be 'rustled' to work as firstly Assistant Librarian and later Librarian at the Royal Astronomical Society. This job has been most rewarding and en-



joyable, despite his early preferences, and he now describes himself as an aesthete on the edge of science. He also served for 18 years in the Royal Naval Reserve, receiving the Reserve Decoration.

Spare time occupations include constructing half finished models of railway equipment and ships, shovelling coal into obsolete steam locomotives on the Severn Valley Railway, classical music, and historical research - originally on the River Severn, later on the life of John Urpeth Rastrick, who built among much else the first steam locomotive to run in America, and on the family ironworks; and most recently on various aspects of astronomical history including the nineteenth century Transits of Venus, the history of the English Mounting, and on Jules Janssen's "Revolver Photographique", the last in collaboration with a French colleague.

Recent publications have included "Some Droitwich Sailing Barges" (Worcestershire Archaeological Society Transactions); "A Far - Off Vision" ; the autobiography of Edwin Dunkin, jointly edited with T C Daniel and published by the Royal

Institution of Cornwall; a lengthy series of short notes in 'Astronomy and Geophysics' on various items from the RAS Library and Archives, referred to as BAOs [Boring Antiquarian Oddments], and recently a full length article in the same journal on Warren de la Rue, HMS HIMALAYA and the "first photographic eclipse".

Other articles and research projects which may get finished one day include "John Urpeth Rastrick, Bridgnorth Foundry, and the building of Chepstow Bridge, 1814 - 1816"; "The Priest and the Stuffed Penguin; Father Stephen Perry SJ and the nineteenth Century transits of Venus"; "The Shuckburghs of Shuckburgh, Isaac Fletcher, and the History of the English Mounting"; "Some Shropshire Shipbuilders"; and "Some personal and practical aspects of Noah Hingley and Sons". He has given numerous talks to local Astronomical societies, to the Royal Photographic Society Imaging Group, and at the AGM of the Scientific Instrument Society, and lectured at the Antique Telescope Society meetings in Bath, Boston (Mass), Flagstaff (Az), and Armagh (Northern Ireland) and at the Science Centre in La Laguna, Tenerife, during the LISA meeting there.

Menus SEC2004

Menu 1

Starter

Terrine of Smoked Chicken and Bacon

Infused with Apple and Vanilla

Main Course

Roasted Seabass on a Comfit of Baby leeks

Served with Vegetables of the Day

Potatoes

Sweet of the Day

Glazed Lemon Torte

Coffee and Mints

(First Drink Included)

Menu 2

Starter

Home Cured Gravdax of Salmon on a

Pink Grapefruit Crush

Main Course

Charred Rack of Lamb on a Red Onion

And Mint Marmalade

Served with Potatoes

Vegetable of the Day

Sweet of the day

Irish Coffee Cheesecake

Coffee and mints

(First Drink Included)

SEC2004 Registrations (in alphabetical order)

Alfredsson	Bengt	Sweden	Meiser	Gernot	Germany
Amin Tafreshi	Babak	Iran	Monk	Richard I	UK
Anderson	Jay	Canada	Nye	Derald	USA
Barr	Derryl	USA	Nye	Denise	USA
Baterson	John	Ireland	O'Byrne	Chris	Ireland
Belik	Marcel	Czech Republic	Olenici	Dimitrie	Romania
Brown	Sue	UK	Ottewell	Guy	UK
Chou	Ralph	Canada	Parkinson	John	UK
Croft	Linda	UK	Pasachoff	Naomi	USA
Danielsen	Arne	Norway	Pasachoff	Jay M.	USA
Delcourte	Kris	Belgium	Peet	John	UK
Demy	Pascale	Germany	Perry	Roger	UK
Djdeiri	Khodashenas	Hamid Iran	Perry	Gillian	UK
Dorst	Friedhelm	Germany	Poitevin	Patrick	UK
Downing	James	USA	Poitevin	Joanne	UK
Druckmuller	Miloslav	Czech Republic	Quaglia	Luca	Italy
Dubal	Leo	France	Quinn	Nick	UK
Eccleston	Jeffrey	UK	Reinhold	Alexander	Germany
Espenak	Fred	USA	Reinhold	Andreas	Germany
Evans	Nigel	UK	Rusin	Vojtech	Slovakia
Felles	Brian	UK	Schmidt	Eckehard	Germany
Felles	Jean	UK	Schneider	Glenn	USA
Fey	Shelly	UK	Seales	Brian	Ireland
Fiel	Denis	France	Sladeczek	Jan	Czech Republic
Fischer	Daniel	Germany	Staps	Dietmar	Germany
Fleet	Richard	UK	Stephenson	Francis Richard	UK
Fleet	Nicky	UK	Thurgur	Ted	UK
Foulkes	Mike	UK	Tiedt	Peter	South Africa
Gill	Michael	UK	Tilley	John	UK
Glintborg	Henrik	Denmark	Tlouzeau	Martine	France
Godard	Jean Paul	France	Totten	Patricia	USA
Goodey	Thomas	UK	Turner	Nick	UK
Graner	Matthias	Germany	Turner	Andrea	UK
Guillermier	Pierre	France	Van Flandern	Tom	USA
Harlow	Mike	UK	van Gent	Robert	The Netherlands
Hatch	Derek	UK	Viterbo	Luís Miguel	Portugal
Hills	Valerie	UK	West	Tony	UK
Hingley	Peter	UK	White	Andrew	UK
Jones	Barrie W	UK	White	Val	UK
Koutchmy	Serge	France	Wiersema	Klaas	The Netherlands
Lariviere	Jean Marc	Canada	Williams	Sheridan	UK
Larson	David	USA			
Larson	Eleanor Burns	USA			
Law	Trevor	UK			
Lenzen	Georg	Switzerland			
Low	Katherine	Belgium			
Lynch	Daniel	Ireland			
Maor	Eli	USA			
Markova	Eva	Czech Republic			
Meeus	Jean	Belgium			

SEC2004 Notes

Solar Eclipse WebPages
(SEWP)

Joanne & Patrick Poitevin
Hall Cottage
Tissington
Derbyshire DE6 1RA
United Kingdom

Phone: +44 (0)7901 565 859

Email:
solareclipsewebpages
@btopenworld.com



[http://
solareclipsewebpages.
users.btopenworld.com](http://solareclipsewebpages.users.btopenworld.com)

Dear SEC2004 Attendee,
Welcome to all of you.