CELEBRATING 40 YEARS 1978 - 2018

The Messenger

Mexborough & Swinton Astronomical Society

July 2018

The Bishop's Ring



Sereno Edwards Bishop
1827 –1909

A Bishop's Ring is a diffuse brown or bluish halo observed around the sun. It is typically observed after large volcanic eruptions. The first recorded observation of a Bishop's Ring was by Rev. Sereno Edwards Bishop] of Honolulu, after the Krakatoa eruption of August 27, 1883.

This gigantic explosion threw a vast quantity of dust and volatile gases into the atmosphere. Sulphate aerosols remained in the stratosphere, causing colourful sunrises and sunsets for several years. The first observation of this ring was published in 1883, being described as a "faint halo" around the sun. Bishop observed the phenomenon on September 5, 1883; the phenomenon was subsequently named after him.

Most observations agree that the inner rim of the ring is whitish or bluish white and that its outside is reddish, brownish or purple. The area enclosed by the ring is significantly brighter than its surroundings. From the sequence of colours with the red on the outside one can conclude that the phenomenon is caused by diffraction because halos always have their red part on their inside. Sulphur compound aerosols derived from volcanic eruptions have been found to be the source for the Bishop's Ring effect.

A Bishop's Ring was observed for a long period of time in Japan after the eruption of Mt. Pinatubo in 1991. Sereno Edwards Bishop was a scientist and Presbyterian minister. He was a regular contributor to The Hawaiian Star newspaper on scientific subjects, from the origin of volcanoes, to offering explanations of sun spots. Several of his written works can be found in scientific publications of his era. His continuous contributions on the subjects of earth sciences and the solar system were his primary fields of scientific interest.



Bishop's Ring due to ash of the Eyjafjallajökull volcano on Iceland, 2010

Two-thirds of the Report are occupied by a discussion of the unusual twilight glows which followed the outburst in the course of November, the blue, green, and other coloured appearances of the sun and moon, the sky haze and some of its effects, and the large corona round the sun and moon in 1883-84-85, generally known as "Bishop's ring." The data accumulated are of extreme value, and astronomers of the eminence of Professor Langley have not hesitated to accept these extraordinary sunrises and sunsets, and the dim reddish halo which coincidently made its appearance about the sun all the world over, as due to the dust and vapour blown into the air on the 26—27th August, 1883. According to the Dutch Commission, the amount which had not descended from the atmosphere several years after the date when it was so violently projected heavenward might

London Evening Standard, Oct 1st 1888

Keep Your Eyes Open



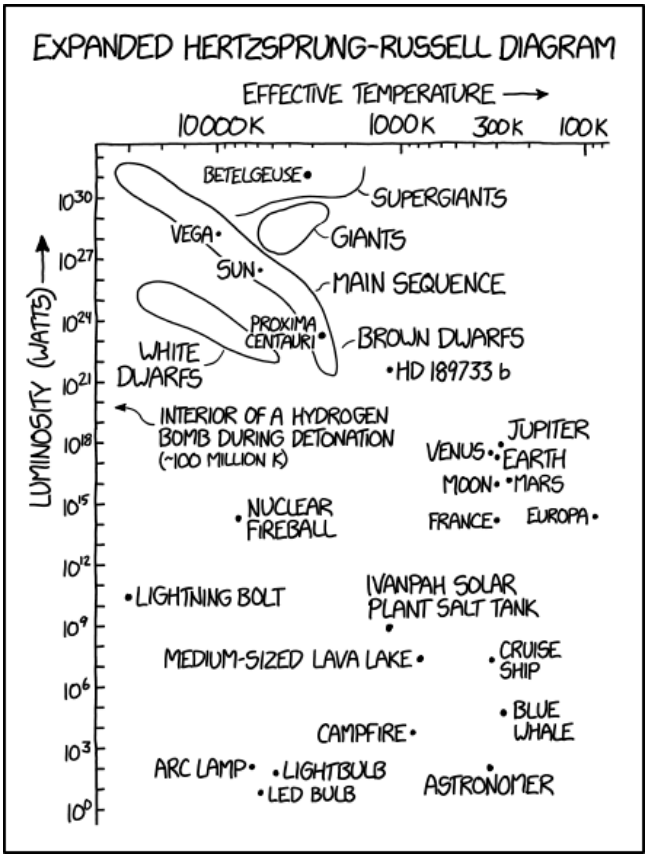
Thursday July 19th **"Solar Flares"**

Prof Philippa is Professor of Astrophyiscs at the Jodrell Bank Centre for Astrophysics at the University of Manchester, where she does a range of undergraduate and postgraduate teaching as well as research. Her research is into the interaction of plasma with magnetic fields in the atmosphere of the Sun, especially solar flares. She also has research interests in magnetically-confined fusion power.



Saturday August 18th – Society Visit to Oxford

This will include a guided tour by Dr Allan Chapman.



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Mike Hall's July 2018 Skynopsis

Diary (all times BST, except Sunrise/Sunset, local (Sheffield) time).

1st	Sunrise 04.40 Sunset 21.39; 02.00 Mars 5°. South of Moon 01.00
4th	00 Neptune 3°. North of Moon
6th	Moon at Last Quarter; 18.00 Earth at aphelion
7th	14.00 Uranus 5°. North of Moon
8th	Sunrise 04.46, Sunset 21.35
9th	20.00 Venus 1.1°. South of Moon
10th	10.00 Aldebaran1.1° South of Moon
11th	04.00 Jupiter stationary
12th	10.00 Dwarf planet Pluto is at opposition
13th	New Moon; 08.00 Moon at perigee (357, 435 km)
14th	22.00 Mercury 7°.South of Moon
15th	Sunrise 04.55, Sunset 21.28
16th	04.00 Venus 1.6 °. South or Moon
19th	Moon at First Quarter
20th	Asteroid (88) 'Thisbe' at opposition (mag +9.7)
22nd	Sunrise 05.05, Sunset 21.19
25th	06.00 Saturn 2°. South of Moon; 07.00 Mercury stationary
27th	Full Moon; 05.00 Mars at opposition; 06.00 Moon at apogee; 20.00 Total Lunar eclipse29th
31st	06.00 Neptune 3°. North of Moon; 08.00 Mars at closest approach

The Solar System and beyond:
Generally poor viewing this month

Moon	The Moon passes through the shadow of the Earth on the 27th; greatest eclipse at 20.22h
Mars	In opposition; good viewing of surface features; unfortunately at declination 23 °!
Jupiter	Still visible low in the south-western sky shortly after sunset

July's Messier Objects – A gallimaufry of Galaxies:

Vulpucula	M27, the Dumbbell Nebula, Mag.7.3, locate at right angle to arrow from faint end star Eta Sagittae
Sagitta	M71, open cluster midway between gamma and delta Sagittae
Lyra	M157, Ring Nebula, midway between beta and gamma Lyrae
Hercules	'M13; The Great Hercules Cluster', two-thirds of the way between eta and zeta Hercules
	M92, Globular cluster North of Hercules pi and left of Hercules sigma
Serpens	M16, The 'Eagle Nebula', in Serpens (Cauda) but to the left of Scutum gamma
Ophiucus	M9, M10, M14, M12, M107

From the Final Frontier

'Parallel Universe?'

Is there a parallel universe? Are there many parallel universes? The theme of many science fiction stories e.g. - Dr Who and Star Trek. Science suggests there could be many universes beside our own; the choices we made in this world are played out in alternative realities.
Around 13.7 billion years ago, according to 'Big Bang Theory', an unknown trigger caused the infinitesimal singularity to expand and inflate into three dimensional space. Eventually condensing out into galaxies, stars and planets; but are we the only universe? We are limited to observations in our 'curved Universe. We are like fish in a fish bowl unable to see outside.
There are at least five theories on why a multiverse is possible!
1. The "Infinite Universes" theory. We don't know exactly the shape of the Universe. The 'Infinite Universes' theory suggests that it is flat and goes on forever. This presents the possibility of many universes. Another theory for multiple universes, come from 'eternal inflation'; 'bubble universes' when space-time as a whole stop inflating in the way our universe 'Big Bang' inflated. This theory implies that other universes could have different laws of physics to our own!
To be continued…

Mike Hall

Refraction Due to the Atmosphere

The effect of the layers of air through which light must pass on its way from a star to the observer upon the Earth is to raise the star apparently above its real position. The effect of refraction is sometimes very obvious when either the Sun or Moon is close to the horizon, in a flattening of the solar or lunar disc. The closer a body to the horizon, the more it is raised by refraction ; the lower limb of the Sun is consequently raised more than the upper, with the result that the Sun appears no longer round, but flattened.

On the horizon a body is apparently raised 34' of an arc.

At an elevation of 1° it is 24' of arc
" " 3° " 14' "
" " 5° " 10' "
" " 10° " 5' "
" " 20° " 2.5' "
" " 30° " 1.5' "
" " 40° " 1' "
Above 40° of elevation the refraction is measured by seconds of arc alone, and becomes less and less till it vanishes at the zenith.

R. S. Ball

Mars 2018 Opposition

Mars is making a close approach to Earth this year on July 31st just 4 days after opposition. Its apparent size will be 24.3 seconds of an arc in size. The main drawback being it will be only 11 degrees high when due south so seeing it will be through a lot of turbulent atmosphere. Visually you will probably have to look at Mars for at least 10 minutes before you get a fleeting glance of a steady view of details.

First of all in July you will start to see the southern polar cap receding gradually as it is spring in the southern Martian atmosphere. Later on in late October clouds start to appear on the northern pole, these are often confused as the northern polar cap but they are clouds which then condense into ice to make the polar cap!

If you have a selection of colour wratten filters try these out to emphasize different features. Yellow darkens the Maria and highlights the dust clouds that envelope Mars, as of mid-June there is one developing, hope it does not go total cover!

A darker yellow filter will help discern the polar cap. My favourite is the orange filter which brings the Maria edges into sharp relief.

A red filter is the best if you can only afford one as it is a good all round performer.

Green shows the polar caps and dust storms.

Blue will show the high general clouds and on each west and east edge of Mars you can see the sunrise and sunset on the limb occasionally.

For those of you wanting to photograph Mars may I suggest that you take 3 give minutes videos of about 5 minutes long do as to give you at least 50 stable images. Each video with a different filter then each video result can be combined to give an overall picture combining many different surface and atmosphere details.

The reason I recommend each video of max length is to eliminate the planets rotation in smearing the combined 3 images.

For those of you who are DSO experts may I suggest you try to image the moons Phobos & Deimos. You will have to expose the moon for quite a few seconds. I cannot vouch for this but if you place Mars just out of the field of view it will not interfere with the moon.

Use the WinJupos or Stellarium program to identify the surface features and moon positions as Mars rotates on its axis every 24 hours and 38 minutes if you observe Mars at midnight then the feature will be in the same position 38 minutes later the next day.

Do not forget that light pollution and the Moon do not interfere too much with planetary observing. Mars should be observable up to late August without losing too much size for viewing so while it is in the window of no astronomical complete darkness look at Mars. Saturn is also visible in the Sagittarius area use Saturn to locate the Messier objects nearby.

Your eye is only open for about a twenty fifth of a second so if our atmosphere is turbulent you will see a poor image. If the seeing improves you will see a sharp image briefly. Video imaging will catch the brief sharp spells so use the highest frame rate you can.

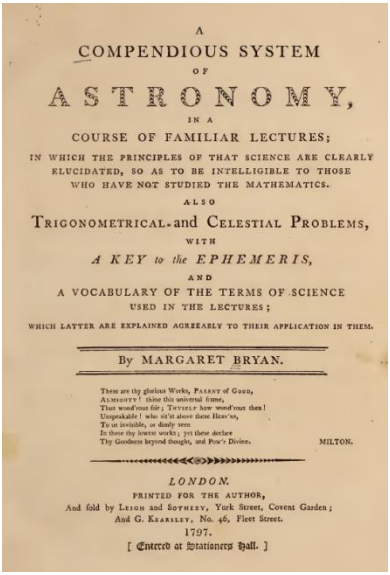
Colin Jubb

"*It fell at a time of year,*
When the face of night is fair on the dewy downs,
And the shining daffodil dies, and the Charioteer
And starry Gemini hang like glorious crowns
Over Orion's grave low down in the west,
That like a silent lightning under the stars
She seem'd to divide in a dream from a band of the blest."

Tennyson

Margaret Bryan





A
COMPENDIOUS SYSTEM
OF
ASTRONOMY,
IN A
COURSE OF FAMILIAR LECTURES;
IN WHICH THE PRINCIPLES OF THAT SCIENCE ARE CLEARLY ELUCIDATED, SO AS TO BE INTELLIGIBLE TO THOSE WHO HAVE NOT STUDIED THE MATHEMATICS.
ALSO
TRIGONOMETRICAL and CELESTIAL PROBLEMS,
WITH
A KEY to the EPHEMERIS,
AND
A VOCABULARY OF THE TERMS OF SCIENCE USED IN THE LECTURES;
WHICH LATTER ARE EXPLAINED AGREEABLY TO THEIR APPLICATION IN THEM.

By MARGARET BRYAN.

These are thy glorious Works, PARENT of GOOD,
ALMIGHTY! thine this universal frame,
Thus wond'rous fair; THYSELF how wond'rous then!
Unspeakable! who sit'st above these Heav'ns,
To us invisible, or dimly seen
In these thy lowest works; yet these declare
Thy Goodness beyond thought, and Pow'r Divine. MILTON.

LONDON.
PRINTED FOR THE AUTHOR,
And sold by LEIGH and SOTHEBY, York Street, Covent Garden;
And G. KEARSLEY, No. 46, Fleet Street.
1797.
[Entered at Stationers Hall.]

Margaret Bryan's year of birth is uncertain, probably before 1760. Her published works are dated 1797 to 1815. She had two daughters, and was married to Mr Bryan. In her thirties, she opened a school for girls near Hyde Park Corner. But Margaret Bryan's school had one remarkable difference: it was an academy for teaching girls mathematics and science.

Bryan was a talented schoolmistress, and in 1797 she published, a Compendious System of Astronomy, with a portrait of herself and two daughters as a frontispiece. Mrs. Bryan dedicated her book to her pupils. The lectures of which the book consisted had been praised by Charles Hutton, professor of mathematics at the Royal Military Academy then at Woolwich.

In later years Margaret Bryan published, lectures on Natural Philosophy (thirteen lectures on hydrostatics, optics, pneumatics, and acoustics.

In 1815 she produced an Astronomical and Geographical Class Book for Schools, "Conversations on Chemistry", published anonymously in 1806, is also ascribed to her. Mrs. Bryan's school appears to have been situated at one time at Blackheath, at another at 27 Lower Cadogan Place, near Hyde Park Corner, and lastly at Margate. She did, indeed, perform many of her own observations – so she wasn't just a schoolteacher who copied work done by others. The desire to cultivate new knowledge and observations of the heavens, for instance, appears in a letter, shown below, that she wrote to William Herschel) on 3 October 1811 asking for his observations in tracking the comet of 1811.

"*I once had the honour of being introduced to you by my friend Dr Hutton; and was most delightfully & politely entertained by you at Slough, and was particularly gratified by perceiving you had afforded me the distinction of placing my portrait in your study: I mention this circumstance that you may recollect who I am. I avail myself of the obliging attention I then received; to solicit your kindness to communicate the result of your observations on the present Comet, so far as relates to its apparent path and its situation in respect to the Sun and our Earth. I have been for some time past taking its right ascension, and declination; and by comparing them, with the same of the Sun; I conceive that it is departing from the Sun and the Earth*"

If anyone would like to see a copy of Margaret Bryans "Compendious System of Astronomy", I have a PDF copy of the book which I can make available by email.

DEDICATION.

To my PUPILS.



ASTRONOMY being the most important Science I have had the pleasure of introducing to your acquaintance, I think, by publishing my Lectures on that subject, I shall afford you a pleasing retrospect of the sublime ideas it conveys: And as I know the recollection of the friend who delivered them will not be unpleasing to you, agreeably to your wishes, I have prefixed my portrait to these Lectures, together with those of my two dear children; hoping by the former to make a more lasting impression on your minds---as, believe me, to be forgotten by you, would inflict a severe pang on that heart which feels for you almost parental tenderness---the truth of which I trust you cannot doubt, as your own breasts bear testimony to the probability, and must naturally infer the certainty, of this assertion. Could it be possible to receive the repeated proofs of your affection which I have received, and not love you? No! Can I ever forget the gratulations you have annually offered me, when each countenance, glowing with affection or dissolving in tenderness, according as the grateful ideas flowed in your breasts, expressed more than your words? Believe me, at those moments I have felt the most sensible sympathy thrill at my heart---such emanations as I then received, glowed too warmly in my bosom ever to be extinguished.

How I have returned your affection you best know. I had but one way of evincing my sincerity, which was, by an industrious application to such studies as would most benefit you, in which employment I was animated by the hope of a reward, and such a reward as deserved all my assiduity to attain---no less than the present and future happiness of my dear Pupils; which, that they may all enjoy, is the ardent wish of their faithful and affectionate

MARGARET BRYAN.

August, 1797.

Dedication by Margaret Bryan in her 1797 book "A Compendious System of Astronomy

Diary

Date	Time	Location	Subject / Event	
Thu July 5th	**19:45**	**Club Room**	**Climate Change**	*Alan Dobbie*
Wed July 11th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu July 12th	**19:45**	**Club Room**	**Astro Clinic**	*The Usual Suspects*
Thu July 19th	**19:45**	**Club Room**	**Solar Flares**	*Prof. Philippa Browning*
Thu July 26th	**19:45**	**Club Room**	**Venus Revisited**	*Roy Gunson*
Thu Aug 2nd	**19:45**	**Club Room**	**TBA**	
Wed Aug 8th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Aug 9th	**19:45**	**Club Room**	**TBA**	
Thu Aug 16th	**19:45**	**Club Room**	**Latest Updates in Astronomy**	*Swirthan Manoharen*
Sat Aug 18th	**07:00**		**Society Visit to Oxford**	
Thu Aug 23rd	**19:45**	**Club Room**	**TBA**	*Barry Jackson*
Thu Aug 30th	**19:45**	**Club Room**	**Autumn Sky**	*Andy Kirton-Vaughan*

(Details correct to time of publication)

Old Moor RSPB – Manvers Way, Barnsley, S73 0YF
TCP - Thryberg Country Park
PVE – Public Viewing Event – Bookable Only
CAE – Community Access Event
PO – Public Outreach
TBA – To be announced – (otherwise – We don't know!)

Web site: http://msas.org.uk
Meeting room is at Swinton Working Men's Club, Station Street, Swinton, South Yorkshire, S64 8AU.
Observatory is at Lee Brook Lane, Hoober, S62 7SH
Mexborough & Swinton Astronomical Society is Registered Charity N° 1064103 in England & Wales

For submissions to The Messenger - Editor: Roy Gunson: royg@gmx.co.uk



The Observatory extension takes shape