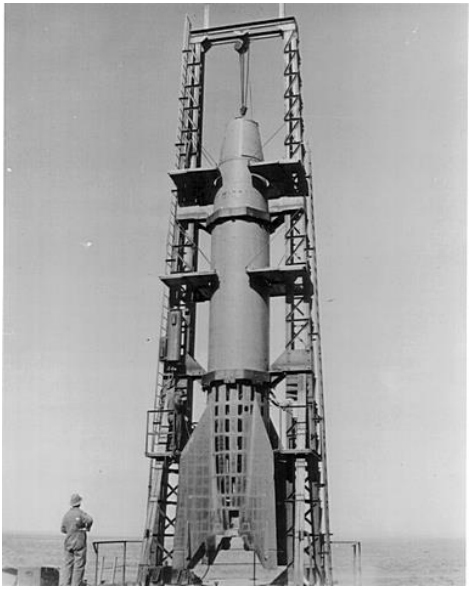
The Messenger
Mexborough & Swinton Astronomical Society
June 2015

Rockets in Space!

Just after the end of the Second World War, the USA acquired a number of V2 rockets captured from the Germans. These were used to start the embryonic space programme and a number were launched eventually reaching "space". The first thing we need to know however is - **How far up is Space?**
The Fédération Aéronautique Internationale (FAI) formed 107 years ago and widely recognised as the governing body for aeronautics, astronautics and related activities, puts the beginning of space at 100km. This is now sometimes dubbed the Kármán line after the person who calculated that aerodynamic lift was impossible at higher levels without attaining orbital velocity. Travellers who cross this line can claim to have reached space, whether or not they have reached orbit, and have earned their astronaut's or cosmonaut's wings. On the other hand, and despite being a founder-member of the FAI, the US has taken a contrary view in awarding astronaut's wings to anyone reaching 50 miles or 80km.

The USA started their tests on 15th March 1946 with a test firing of a V2 rocket, given the snappy title "V2 No 1", this never left the ground and was merely an engine burn of 57 seconds. "V2 No 2" launched on 16th April 1946 and reached the heady heights of 3.4 miles before one of its fins fell off. [Official Comment - *Structural failure of fin 4 prior to cutoff. Rocket demolished at impact from explosion of unused propellants.]*
V2 No 3 was launched on 10th May 1946 and rose to 70 miles, technically for the Americans "In Space" – but not for everyone else. It had a Geiger counter on board – but that and the recorder were destroyed on impact when it returned to Earth!
V2 No 4 set off on the 29th May and got to 69.7 miles, another American success – but not space for everyone else
V2 No 5 got to 73 miles, No 6 got to 67 miles, No 7 83.6 miles. No 8 was a failure, but at attempt number nine, V2 No 9 made 100.4 miles – and everyone agreed this was in space!



The record holder for the V2 program was V2 No 17 which made an altitude of 114 miles. In total 67 V2 rockets were fired from White Sands – the majority reaching between 60 – 80 miles. Two V2 were launched from Cape Canaveral in 1950 to test different fuel mixes, one of these launces reached Mach 9 – at that time the fastest man-made object.

The Thoughts of Chairman Les



I would like to welcome those new members that have joined us since our last journal and I hope that you have many interesting and happy years with us.
With reference to The Feasibly Study Group there was a meeting of this group Wednesday 20th May. We have, at last, had a reply from Yorkshire Water Services asking us '. . . to prepare an offer for the purchase of this land'. . . For those of you that might not be sure about this is the piece of land on which the observatory is on.
This stems from the site meeting we had with YWS Friday 6th, February 2015 when a lot of discussion about us and the site took place, not least the purchase of the land.
This question from YWS will be an agenda item for the next committee meeting in June when a decision on our offer for the land will be decided and I will keep you up-to-date on this.
There are meeting dates for the Feasibility Study Group scheduled for June, July and August so if you have any ideas for the observatory and its development please let us know.
To help keeping you informed we think it a good idea to give everyone, particularly our newer members, a chance to visit and inspect the observatory, as soon as we know numbers we can organise a date for a visit, so let us know if you are interested.

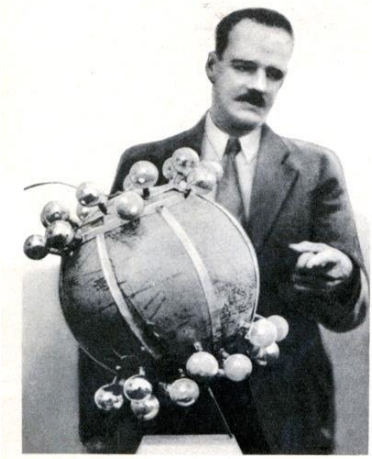
I wish you clear skies

Les Marsden FRAS

So This is How the BBC do their Weather Forecasts!

That's a load of crystal balls!

Crystal Balls Tracing Planet Paths on Globe Predict Weather



With this crystal-studded schoolroom globe J. C. Brown hopes to predict weather, years ahead, through movements of planets.

POSITIVE predictions of weather at any future time are declared possible by James C. Brown of La Porte, Texas, once an eleven year period of tests for his "Astronomer" weather machine reaches completion.

Depending upon movements of the planets for its weather predictions, the machine consists of an ordinary schoolroom globe on which have been traced the paths of the sun and moon. Crystal balls placed in pairs at 45 degree latitude on each side of the equator burn paths around the globe which, in the course of 24 hours, will record any variation in movements of the sun, moon, or stars.

The long test period is necessary to set up charts. Future readings of the machine can then be compared with similar readings on the charts to obtain the weather forecast. Movements of certain bright stars can also be recorded on the globe.

From March 1935 Modern Mechanix Magazine

Recent Talks and Visits



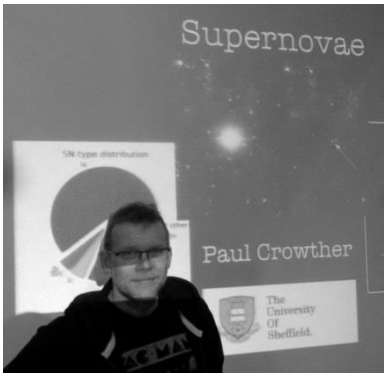
Professor Carlton Baugh

On 21st May 2015, Professor Carlton Baugh gave us a talk entitled "The Hunt for Dark Energy" in which he explained that most of the stuff in the Universe today is "Dark Energy". No-one knows what the dark energy is but there are plenty of theories. He tried to explain to us and Les why we think the dark energy is there and what we are doing to learn more about it.
Photograph of Professor Baugh and Mini-Les courtesy of Phil Muffett

Professor Roger Eccleston

On the 12th May a group of us (Roy Gunson, Paul D'Silva, Phil Muffett, Steve Taylor & Elaine Walton) paid a visit to Sheffield Hallam University to hear the Professorial Lecture given by- Professor Roger Eccleston entitled -
"***Big, little and all - or how to travel in space and time, and what you might see when you get there***"
The lecture was about the opportunities physicists have to travel in space, to study the very large and the very small, and in time, to observe phenomena that occurred at the birth of the Universe. Sophisticated research facilities allow us see beyond the visible spectrum to, for example, witness and understand the birth of stars and to observe the structure and behaviour of materials at an atomic level.





Professor Paul Crowther

On the 30th April we were visited by Professor Paul Crowther of Sheffield University who gave a talk on Supernovae. He detailed discoveries of supernovae over the past decade, emphasising the diversity of core collapse supernovae now known, including recently identified super luminous supernovae and supernova imposters. He discussed the supernovae themselves plus the progenitor stars that are believed to be responsible for these incredible astrophysical transients.

Mike Hall's June 2015 Skynopsis



Diary (all times BST unless otherwise specified)

2nd	Full Moon, Saturn evening object
5th	Sunrise 04.47, Sunset 21.34
6th	Venus at half phase
7th	Arietids meteor shower
9th	Moon at Last Quarter
10th	Sunrise 04.44, Sunset 21:39
15th	Sunrise 04.43, Sunset 21.42; Lyrids
16th	New Moon
20th	Sunrise 04.43, Sunset 21.44
21st	Summer Solstice
24th	Moon at First Quarter
25th	Sunrise 04.44, Sunset 21.45
30th	Sunrise 04.47, Sunset 21.44; conjunction of Venus and Jupiter

The Planets

Mercury	Morning planet but visibility poor
Venus	Best at the start of the month, descending into evening twilight West North West; eastern elongation 6" (45.5deg. east of the Sun). See also Galactic Goodies below.
Mars	Not visible this month
Jupiter	Low evening planet, poor telescope viewing. See also Galactic Goodies below
Saturn	Low well positioned in between theta and lambda Librae; closest on 29th.
Uranus	Early morning sky, before sunrise just south of double star zeta Piscium
Neptune	Morning planet, visible at the end of the month.
Venus/Jupiter	Moving closer together, very good opportunity on the 20th-25th together with a crescent Moon; Venus showing a crescent of 28" and Jupiter 33"

Galactic Goodies

Arietids	Best on 5/6th, 6/7th but unfavourable viewing due to moonlight
Lyrids	15/15th, low rate but favourable viewing
Asteroid Palas	In opposition on 12th among the stars of Hercules
Y Canis Venatici	"La Superba" bright red coloured star, visible with binoculars or small telescope

Deep Sky challenges:

M92 (NGC 6341)	Can be seen right of alpha Lyrae between the arms of Hercules; near to M13 below Nu Heculis (RA 17h 17m 1sec/Dec +43deg 8min, Mag. 6.4)
Scutum Star Cloud	In the constellation of Scotum, includes: M11 (RA 17h 17m 1s; Dec +43 8min; mag. 6.4) M26 (RA 18h 45m 2sec; Dec + -09deg 24min, Mag. 8.0) IC1295 planetary nebula (RA 18h 54m 37s; Dec.-08deg. 49m 39.08s)

The White Spots on Ceres

The Dawn Spacecraft has offered its closest tantalising glimpse of the mysterious white spots inside a crater on the dwarf planet Ceres.

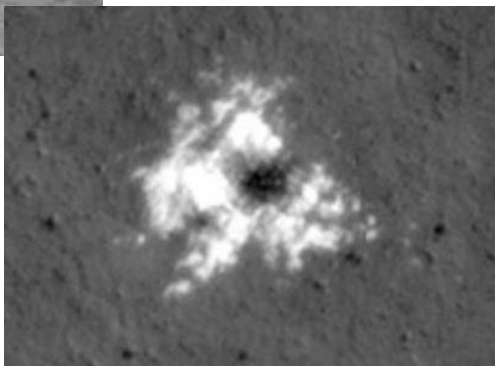
Unfortunately the spots seem to have "saturated" the gain of the imaging camera so no amount of tweaking with the image can clarify the detail of these spots.

The best guess at the moment is that the spots represent some exposed surface water ice that is in the process of sublimation into space. Undoubtedly as the spacecraft produces more photographs and analysis of Ceres we will soon get to know these curious features better.

The only thing astronomers can say for sure at this point is that the glowing spots are some sort of reflective substance on the surface. In the newest pictures, they resemble small impact craters on Mars where the impactor excavated ice from under the surface. On Mars this ice is covered quickly by dust. But on Ceres, it could remain visible for a long time before the ice sublimates to vapour.



Ceres White Spots

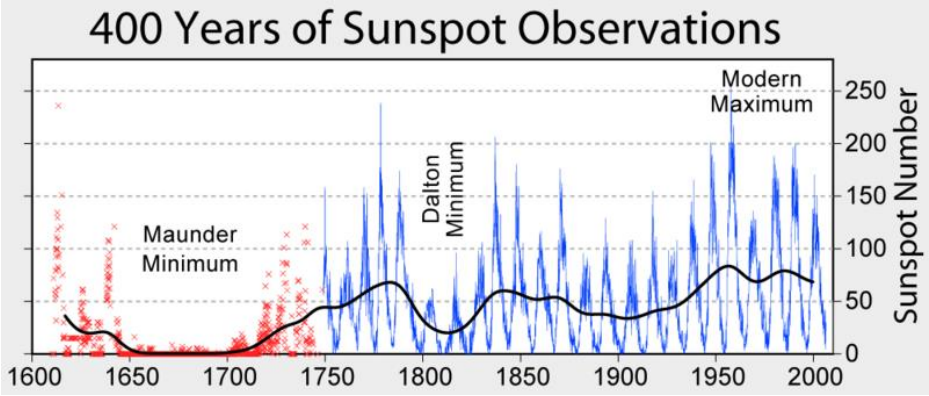


A Martian "White Spot"

Sunspots & Solar Cycles

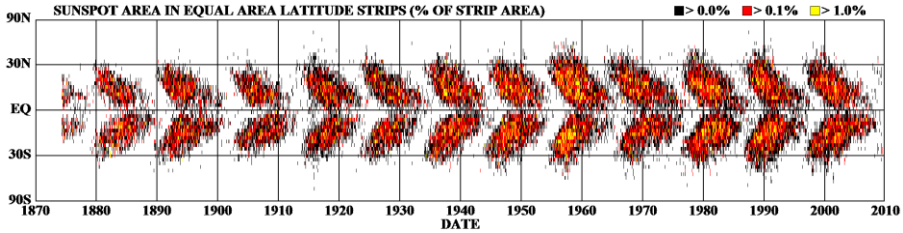
by Brian Ventrudo

In the mid 19th-century, after many years of diligent solar observation, the German astronomer Samuel Schwabe noticed the number of sunspots visible on the sun's disk rises and falls in nearly regular 11-year cycle.
In peak years of the cycle, he found, there were spots visible on the sun most days, and hundreds of spots and groups of spots during the course of a year.
In lean years, roughly 5.5 years after the peak, there were weeks or months when astronomers saw not a single sunspot, with fewer than a dozen spots observed during the year.
This regular cycle was traced back to the earliest telescopic observation of the sun in the 1600's, and has been recorded in increasing detail by modern astronomers right up to the present day. (The diagram below shows a measure of the sunspot number over time since the 17th century. The 11-year period is clearly visible).



The number of sunspots over time since the year 1600.

What's even more interesting is where the sunspots occur on the solar disk. As the number of sunspots rises from a minimum, the spots appear north and south of the solar equator, usually in the mid solar latitudes around 40 degrees.
As the cycle continues, sunspots appear closer to the equator until at the next minimum, most spots appear in a narrow band at the equator. Then, it all starts over again. A plot of the position of sunspot position over time, shown below, is called the Maunder diagram or the "Butterfly Diagram".



The solar "Butterfly Diagram", which shows the solar latitude of new sunspot groups over time in a number of solar cycles

This periodic change in the number and position of sunspots was a striking discovery. And it's not just the number of sunspots that varies every 11 years. The sunspot cycle also matches up with other activity on the sun, including violent mass ejections, the size and extent of the outer reaches of the sun called the corona, and the intensity of light and charged particles the sun blasts out into space to affect the atmospheres and magnetic fields of many planets in the solar system, especially Earth.
This near-regular 11-year variation in sunspots and other solar activity is called the solar cycle. It seems to be but a symptom of a complex and dimly understood dynamic process inside the sun called a "solar dynamo" that generates the sun's global magnetic field. To make matters even stranger, the magnetic field seems to flip its polarity once every two sunspot cycles, or 22 years, which means the magnetic polarity of the sunspot pairs on the solar disk flips direction from cycle to cycle.

With permission from The One Minute Astronomer: http://oneminuteastronomer.com/

A Correſpondent informs us, that the Face of the Sun has been particularly obſcured ſome Days paſt, by a more than uſual Number of very large Spots, few of which are leſs than our Earth; but one in particular, a tenth Part as wide as the Sun. This enormous Spot began to appear on Saturday the 4th Inſt. in the Form of many dark Points; each of which was gradually ſurrounded by a dark Atmoſphere, and were on Wedneſday joined, ſo as to appear one entire Spot, darker in ſome Places than in others. Theſe Spots ſufficiently mark the Motion of the Sun about its Axis, by their gradual Change of Situation upon its Diſk.

Derby Mercury, November 10th 1780

SUNSPOTS AND RAINFALL.

The monthly meeting of the British Astronomical Association was held on Wednesday evening. A diagram shown by Mr. Maunder had reference to the connection, or otherwise, between sun-spots and rain. Several members referred to Mr. Maunder's diagram as having exploded the idea of there being any connection between sun-spots and the rainfall.

Yorkshire Evening Post, November 27th 1903

Programme for June & July 2015

Date	Time	Location	Subject & Speaker
Thu Jun 4th	19:45	Club Room	**Guide to Equatorial Mount Telescopes** *Various*
Sun Jun 7th	14:00	Observatory	**CAE – Solar Observing**
Wed Jun 10th	19:45	Club Room	**Executive Committee Meeting**
Thu June 11th	19:45	Club Room	**Who Knows?** *Phil Muffett*
Sun June 14th	10:00	RSPB, Old Moor	**Public Outreach** **View the Sun as Never Before**
Thu June 18th	19:45	Club Room	**Images of Universe 6** *Paul Money*
Fri Jun 19th	19:45	Club Room	*Dr Alan Chapman*
Thu June 25th	19:45	Club Room	**Annual General Meeting**
Sun June 28th	11:00	Thrybergh Country Park	**Public Outreach** **Fun Day**
Sun July 5th	14:00	Observatory	**CAE - Solar Observing**
Wed July 8th	19:45	Club Room	**Executive Committee Meeting**
Sun July 12th	10:00	RSPB, Old Moor	**Public Outreach** **View the Sun as Never Before**
Thu July 16th	19:45	Club Room	**How to Build a Universe** *Dr Stuart Muldrew*
Thu July 30th	19:45	Club Room	**Improving Your Telescope Performance** *John D Timmins*

Old Moor RSPB – Manvers Way, Barnsley, S73 0YF
Wentworth Castle – Stainborough, Barnsley, S75 3ET
Thryberg Country Park – Doncaster Rd, Rotherham, S65 4NU
PVE – Public Viewing Event
CAE – Community Access Event

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^{o} 1064103 in England & Wales

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

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NOTE : AGM Thursday 25th June