The Messenger
Mexborough & Swinton Astronomical Society
September 2017

Fred Hoyle



A Yorkshire Astronomer, born in the village of Gilstead (near Bingley) on 24th June 1915. He went to Bingley Grammar School from where he managed to obtain a place at Cambridge to read mathematics at Emmanuel College.

At the outbreak of the second world war he worked for the Admiralty on radar projects and worked with Hermann Bondi and Thomas Gold, who along with Hoyle the main instigators of the "Steady State Theory".

After the war he made a breakthrough in the theory of Stellar Nucleosynthesis, predicting the 7.7 MeV resonance of the carbon-12 nucleus. (The production of the amounts of carbon in the universe was a mystery before this time, the resonance however –was found in the 1950's despite some resistance from nuclear scientists. This resonance allows the formation of reasonable larger amounts of carbon in the universe).

His co-worker William Alfred Fowler eventually won the Nobel Prize for Physics in 1983, but for some reason Hoyle's original contribution was overlooked by the electors, and many were surprised that such a notable astronomer missed out.

Hoyle, along with Bondi and Gold was a strong opponent of the Big Bang Theory – even though it is |Hoyle who is credited with the "Big Bang" terminology – even if he originally meant it in a derogatory way. He famously was quoted on the BBC as saying "*The reason why scientists like the "big bang" is because they are overshadowed by the Book of Genesis. It is deep within the psyche of most scientists to believe in the first page of Genesis*".

In 1993, in an attempt to explain some of the evidence against the steady state theory, he presented a modified version called "quasi-steady state cosmology", but the theory is not widely accepted.

In his later years, Hoyle became a staunch critic of theories of abiogenesis to explain the origin of life on Earth. With Chandra Wickramasinghe, Hoyle promoted the hypothesis that the first life on Earth began in space, spreading through the universe via panspermia, and that evolution on Earth is influenced by a steady influx of viruses arriving via comets. They advanced several instances where they say outbreaks of illnesses on Earth are of extra-terrestrial origins, including the 1918 flu pandemic, and certain outbreaks of polio and mad cow disease. Other theories away from the mainstream of scientific thought he is credited for include: The correlation of flu epidemics with the sunspot cycle; The fossil Archaeopteryx was a man-made fake; The use of the fifty-six Aubrey holes at Stonehenge as a system to predict eclipses.

Hoyle also wrote science fiction. In his first novel, The Black Cloud, most intelligent life in the universe takes the form of interstellar gas clouds; they are surprised to learn that intelligent life can also form on planets. He wrote a television series, A for Andromeda, which was also published as a novel. His play Rockets in Ursa Major had a professional production at the Mermaid Theatre in 1962

He was the founding director of the Institute of Astronomy, Cambridge. He was knighted in 1972

Fred Hoyle on the Universe

By Our Radio Critic, ARCHIBALD KENYON

MR. FRED HOYLE, a Yorkshireman with the native knack of putting things plainly, in more senses than one, has finished his talks on the Nature of the Universe, of which the central theme was the concept of continuous creation. They could well be cited in support of a recent compliment to the B.B.C. on their growing courage in giving controversial questions the freedom of the air, and as evidence too of their confidence in public demand for them.

Mr. Hoyle indicated one of his difficulties when he said he had had to pass over in one or two moments the results of more than 1,000 printed pages of mathematics. This problem must be even greater on the other side of the microphone, but the difficulty here seems not to have dulled appetite for serious subjects and never, of course, does it keep people of strong views from telling the Fred Hoyles of the scientific world just where they have gone wrong. Mr. Hoyle laid himself open to attack from the materialists, "the apparent simplicity of whose case is only achieved by taking the universe for granted," whereas he wants to know why it is as it is, and why it is here at all; and, on the other hand, from critics who sincerely believe they know the answers, though "hardly any two agree between themselves." Criticisms by Professor Dingle and Dorothy Sayers will be broadcast on Tuesday.

Yorkshire Post 22nd September 1950

The Thoughts of Chairman Les



I found the month of August to be full of activities in particular dealing with items for all kinds of solar observing. These items dealt with almost everything for this kind of observing in absolute safety with a lot of enthusiasm. I think that all this enthusiasm could well be because of the Total Solar Eclipse in America. A number of our members made the trip to observe and photograph the whole thing as they have done quite a few times over the years. We can look forward to October when Tony M will be giving a rundown on how things went.

September is an important month as we start our Public Viewing Evenings (PVE's) when we open the observatory doors to the public using a booking system as we usually get very busy. However we find that a lot our membership is seems to find that they are unable to help man these evenings which makes things very busy for the few that do help, might you be able to help?

With regards to our Outreach Programme we will be busy on two occasions at Thrybergh Country Park; Saturday 2 September is our annual 'Night under the Stars' which will be from 1900 to 2200hrs. Saturday 16 September will be another annual date and is their 'Fun Day' (time to be confirmed). Our first Community Access PVE of the season will be Friday 29 at the observatory and needs to be booked in advance, let me know if you want a place or two. We also have two guest speakers in the month; Thursday 21 is Rod Hind who will deal with 'Life and 'Works of Edward Emmerson Barnard'. Our second guest speaker will be Paul Money reminding us of the 'Triumphs of Voyager part 2' which will be Thursday 28. To round off the month our first Community Access PVE of the season will be Friday 29 at the observatory and needs to be booked in advance, let me know if you or your friends want a place or two.

Les Marsden

Chairman & Founder Member

Mike Hall's September 2017 Skynopsis



Diary

(all times BST Greenwich, local (Sheffield) time).

1st	Sunrise 06.15, Sunset 20.34, Venus 1.4° South of Beehive Cluster
4th	16.00 Mercury stationary; 18.41 Moon at descending node
5th	00.00 Mercury 3.2° of Mars; 0 4.00 Neptune at opposition; 11.00 Jupiter 3° N. of Spica
6th	07.00 Full Moon, 05.00 Neptune 0.5° North of Moon
8th	Sunrise 06.27; Sunset 19.40; Asteroid (89) Julia at opposition Mag. +9.0
9th	10.00 Uranus 4 ° North of Moon
10th	05.30 Mercury 0.7° South of Regulus
12th	10.00 Mercury at greatest western elongation, 17.9° W
13th	06.00 Moon at Last Quarter; 16.00 at perigee 369, 859 km
15th	Sunrise 06.39, Sunset 19.23; 12.00 Mercury at perihelion
16th	18.00 Mercury 0.1° North of Moon; 14.50 Beehive Cluster 3.1° North of Moon
17th	18.28 Moon at Ascending Node
18th	00.56 Venus 0.5° North of Moon; 04.32 Regulus 0.1° South of Moon;
19th	21.30 Venus 0.4° North of Regulus
20th	05.00 New Moon
22nd	Sunrise 06.51, Sunset 19.23, 07.51 Jupiter 3.7° South of Moon
27th	00.09 Saturn 3.5° South of Moon; Moon at Apogee: 404 342 km;
28th	Moon at First Quarter; Sunrise 05.17, Sunset 21.08
29th	Sunrise 07.04, Sunset 18.49

The Solar System

Mercury	Emerges from inferior conjunction to give good morning viewing; starts the month in Leo, moving into Virgo on the 26th.
Venus	Brilliant in the morning sky, shining at -3.9 throughout the month
Mars	Visible in the morning sky, lying close to Venus at the end of the month
Jupiter	Visible early in the month only
Saturn	Visible very low in the South West after sunset
Uranus	Visible before midnight in the east in Pisces
Neptune	Comes to opposition of the 5th visible after midnight
Meteors	No major meteor showers this month

Galactic Goodies.

Veil Nebula	In Cygnus, rated as the prettiest deep-sky object; RA 20h 50m, Dec +32 00' Mag. +10
Messier 33 galaxies	Known as the Triangulum galaxy; a spiral galaxy, the 3rd largest in local group of

The Piscid meteor shower will reach its maximum rate of activity on 9 September 2017 (ZHR ~5)

Keep Your Eyes Open



Les Marsden

Saturday September 2nd - A Night Under the Stars

We are putting on an event for the public at Thrybergh Country Park. Telescopes and members help would be appreciated.
Les will be doing his usual presentations.

Thrybergh Country Park, Doncaster Road, Rotherham, South Yorkshire S65 4NU



Rod Hine

Thursday 21st September – Life & Works of Edward Emmerson Barnard : Rod Hine

Rod Hine is a former lecturer (Retired) at University of Bradford and previously a lecturer at Kenya Polytechnic. Originally from Chingford, Rod now lives in Bradford and is currently Chairman of the Bradford Astronomical Society.



Paul Money

Thursday 28th September – Triumphs of Voyager Part 2

Paul Money celebrates the fact that 2017 is the 40th anniversary of the launch of the Voyager space probes to the outer solar system. The second of two talks takes a look at the remarkable mission and the many discoveries the Voyagers made and continue to make. Paul returns to continue the Voyager journey towards Uranus, Neptune and beyond. The first part of this talk was given on 18th May.



Phil Muffett

Saturday 7th October – RSPB Old Moor

The RSPB team at Old Moor and Mexborough and Swinton Astronomical Society are presenting an evening of natural spectacle. The RSPB staff take public on a guided walk to see the birds coming in to roost at sunset and then as the skies darken our members will show the public the wonders of the night sky.



Carlton Baugh

Thursday 19th October – Mapping the Universe to measure dark energy :

Professor Carlton Baugh will describe why we think there is dark energy in the Universe and how we can use maps of galaxies to understand more about the dark energy and will review the ways in which cosmic cartography has evolved over the years.
Carlton is Professor in the Department of Physics at Durham University and a member of the Institute for Computational Cosmology. His

Making Solar Filters – August 10th – Club Room

Paul D'Silva, in the best "Blue Peter" tradition got us all making solar filters at the club room. Great fun was had with the pre-cut plastic templates prepared earlier to the exact size of our scopes. The glue, sticky backed plastic and Bader sheets filled the air – as well as some choice words from Phil!





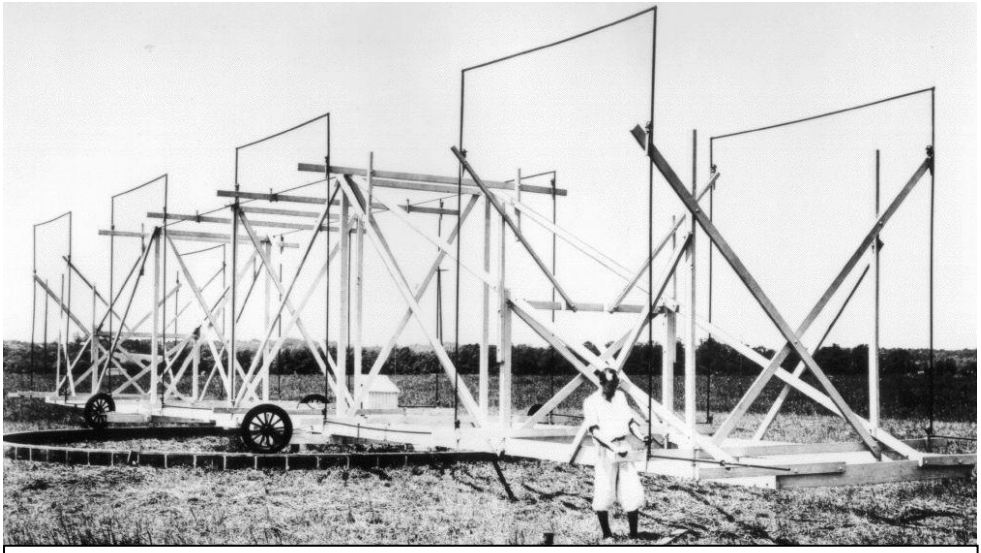


The Mysterious Hiss from the Milky Way

In the early 1930's, Bell Labs, the research division of AT&T, launched a project to use radio "short waves" to transmit telephone calls across the Atlantic. The technology to transmit signals via short waves was reasonably well understood. But engineers also needed to understand sources of noise that might interfere with radio communications signals. So the powers-that-were at Bell Labs tasked a young engineer to find sources of radio static that might interfere with transmissions. During his work, this young engineer, Karl Jansky, made an accidental discovery that revolutionized astronomy.

To search for sources of naturally-produced radio noise, Jansky built an antenna to detect radio waves at a frequency of about 20.5 MHz (a wavelength of 14.5 meters). He mounted the antenna on four Ford Model-T tires so he could rotate his contraption to determine the direction of any radio signal he might find. The antenna was jokingly called "Jansky's merry-go-round".

After tweaking his antenna and receiver for several months, Jansky found static from nearby and distant thunderstorms. But he also found a faint steady radio hiss of unknown origin. The intensity of the hiss rose and fell once a day. At first, he thought the unknown static might be radio waves from the Sun.



Karl Jansky's "Merry-go-round" Antenna

After a few months of following the signal, the brightest source of radio waves slowly moved away from the Sun. The signal repeated not every 24 hours, but every 23 hours and 56 minutes, the same period in which the stars rise and set.

Jansky eventually figured out the radiation was strongest in the direction of the center of our Milky Way galaxy, towards the constellation of Sagittarius. The discovery of strong radio waves from the center of the galaxy was widely publicized, appearing in the New York Times on May 5, 1933.

This was an astonishing and totally unexpected discovery. But there was no one– no scientist anywhere on Earth– who had the tools or time to study it further. Jansky very much wanted to continue his work and learn more about the galactic radio waves, but he was assigned to another project by Bell Labs managers and never again studied this mysterious radio "hiss" from the Milky Way.

Many scientists were fascinated by Jansky's discovery. But no one followed up on it for several years until a modest radio engineer from Chicago became the world's first true radio astronomer.

However, a young ham radio operator and radio engineer from Chicago named Grote Reber read of Jansky's discovery of "cosmic radio waves" in the newspapers. He was captivated by the discovery and applied to work with Jansky at Bell Labs in Holdmel, New Jersey. But the Great Depression prevented Bell from hiring new staff.

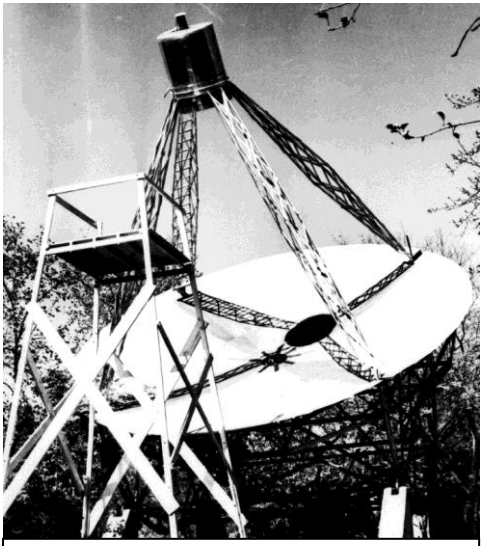
Rebuffed by Bell Labs, Reber worked a day job as an engineer with several radio manufacturers from 1933 to 1947. In his spare time, at his own expense, he built his own 30-foot radio antenna out of sheet metal. Just like an optical telescope, Reber's construction used a parabolic mirror to focus all wavelengths to a single point. There, 20 feet above the dish, he mounted his radio receiver to amplify the faint cosmic signals by millions of times, making them strong enough to record on a strip chart. Reber had constructed the world's first radio telescope, and for a time, this young man from the Chicago suburbs was the first– and only– radio astronomer.

With his backyard radio telescope, Reber confirmed Jansky's discovery of radio waves from the Milky Way, and found radio emission from the Sun and mysterious radio sources in the constellations Cassiopeia and Cygnus. In time, scientists discovered that the radio emissions from the center of our galaxy were caused by electrons accelerated in a strong magnetic field near the galactic center.

From 1938 to 1943, Reber made the first surveys of radio waves from the sky and published his results widely. His work ensured radio astronomy became a major field of research following World War II.

When other better funded researchers began covering more and more of the radio spectrum, Reber turned to longer-wavelength radio waves in the 1950's. Such signals penetrate the Earth's atmosphere in only a few places, including northern Manitoba in Canada and Tasmania in Australia. Reber chose Tasmania for its relative isolation (and perhaps its better weather) and spent 50 years on the deep-southern island. He died there in 2002 at the age of 90.

Reber's work was the end of a golden age of astronomy, when an accomplished amateur could make ground breaking discoveries. This often happens in a new and young science, where professionals, by definition, don't yet exist. Despite his efforts as a professional radio engineer to build and use the first radio telescope, Reber was an amateur astronomer. The true revolution in radio astronomy dawned after the Second World War when professional physicists and astronomers began to study the sky with larger and more sophisticated radio telescopes. It was a revolutionary advance in science. In a 1998 article in the New York Times commemorating Jansky's work, the astronomer Jesse Greenstein said that analysis of radio waves emanating from space provided researchers with "10,000 times the information" they could get from optical astronomy. "It led to information that overturned the idea of a rationally developing universe," he said, "and replaced it with a relativistic, ultra-high energy cosmos of scary, violent, uncontrollable forces like black holes and quasars. It was a revolution."



Grote Reder's first Radio Telescope

By Brian Ventrudo
Cosmic Pursuits - cosmicpursuits.com
(with permission from the author)

Diary

Date	Time	Location	Subject / Event	
Sat Sep 2nd	**18:30**	**TCP**	**A Night Under the Stars**	*Les Marsden*
Thu Sep 7th	**19:45**	**Club Room**	**TBA**	
Wed Sep 13th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Sep 14th	**19:45**	**Club Room**	**Stars : Part 1 Constellations and other groupings**	*Roy Gunson*
Sat Sep 16th		**TCP**	**Funday**	
Thu Sep 21st	**19:45**	**Club Room**	**Life & Works of Edward Emmerson Barnard**	*Rod Hine*
Thu Sep 28th	**19:45**	**Club Room**	**Triumphs of Voyager : Part 2**	*Paul Money*
Fri Sep 29th	**19:45**	**Observatory**	**PVE**	*Les Marsden*
Thu Oct 5th	**19:45**	**Club Room**	**Stars : Part 2 Brightness & Distance**	*Roy Gunson*
Sat Oct 7th	**18:00**	**Old Moor RSPB**	**Public Event**	*Les Marsden*
Wed Oct 11th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Oct 12th	**19:45**	**Club Room**	**TBA**	*Alan Dibbo*
Thu Oct 19th	**19:45**	**Club Room**	**Mapping the Universe to Measure Dark Energy**	*Prof Carlton Baugh*
Thu Oct 26th	**19:45**	**Club Room**	**Solar Eclipse Report**	*Tony Morris*
Fri Oct 27th	**19:45**	**Observatory**	**PVE**	*Les Marsden*

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

Anniversary

2018 will be this society's 40th anniversary. If anyone has any ideas on what we should be doing to celebrate the occasion please let any of the club committee know. For those unsure who the committee is – the members are as follows;

Les Marsden – Chairman
Shaun O'Dell – Secretary
Glenn Marsden – IT Officer
Paul D'Silva – Fundraising Officer
Andrew Kirton-Vaughn – Observations Officer
Roy Gunson – Deputy Chair
Mick Collinson – Treasurer
Tony Morris – Curator
Steve Taylor – Programme Coordinator
Phil Muffett – Member without Portfolio