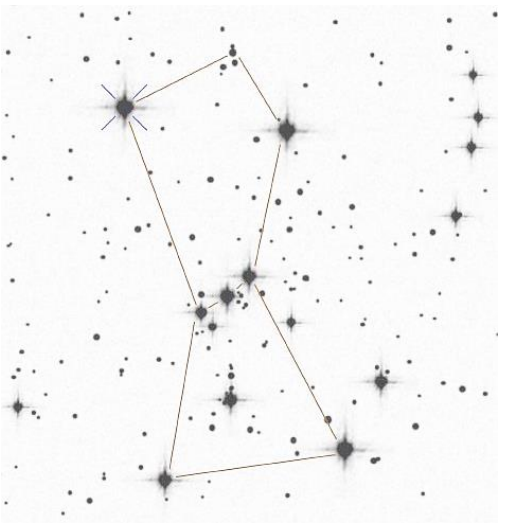
CELEBRATING 40 YEARS 1978 - 2018

The Messenger

Mexborough & Swinton Astronomical Society

March 2018



Gilgamesh (sometimes called Uru An-na) was the king of Sumeria With his splendid robes, crown, a giant amongst men, Ishtar, the Goddess of Love and War, is so smitten that she begs him that she wishes to bear his children and she promises him all the riches of the world.

Gilgamesh refuses to be her "plaything", and he has nothing to offer her as he is a mere mortal. He tells her that her desire for him is fleeting as she has transformed all her previous lovers into beast of the field.

Ishtar is very angry and goes to her father Anu, the God of the firmament and to her mother, Antum, to let her turn the Bull of Heaven loose on to Gilgamesh so she can watch him die in agony.

Anu however doesn't allow Ishtar to have the Bull as all that Gilgamesh said was true. Ishtar then threatens to let all the dead people out of the underworld so they can feast on the living, unless her parents give her the bull. Still Anu hesitates. He warns her that the bull will cause seven years of famine. Ishtar assures him that she has made provisions for the people and the flocks of Uruk, and he gives in.

Ishtar unleashes the bull. The city of Uruk trembles as, bellowing and snorting, it comes down from the sky. Gilgamesh and his trusted friend Enkidu stand ready to defend the City.

A crack opens up in the earth, and one hundred men fall into it and die. Again the bull bellows and again the ground cracks open. One hundred more men are swallowed up. The third time this happens, Enkidu attacks the bull. The bull spits on him and fouls him with its excrement, but Enkidu grabs it by its horns and wrestles with it. He calls out to Gilgamesh, who joins him, and they fight the bull together. At last Enkidu seizes its filthy tail and holds the monster still so that Gilgamesh can thrust his sword between its shoulders and kill it. Then they cut out its heart and offer it as a sacrifice to Shamash the sun god.

Ishtar climbs onto the walls of the city and shouts curses at the two friends. Enkidu picks up one of the bull's bloody haunches and hurls it at her. He shouts that if she comes closer, he'll do the same to her. While Ishtar and her followers mourn the bull, Gilgamesh gathers his craftsmen together and shows them how beautifully the gods had made the creature, how thickly its horns were coated with precious blue stone. Gilgamesh cuts them off its head and fills them with oil, which he offers in sacrifice to his father, Lugulbanda. Then he hangs them on the wall of his palace as trophies. Gilgamesh and Enkidu scrub the bull's gore off their bodies in the Euphrates and ride in triumph through the streets of Uruk, basking in the people's admiration. Gilgamesh boastingly asks the crowds who the best hero is and answers his own question: "Gilgamesh is. Enkidu is."

This is why Orion (Gilgamesh) chases the Bull of Heaven (Taurus) cross the sky.

Sonny Rugo

Keep Your Eyes Open



Thursday 8th Mar **"Backyard Worlds; Hunting for Brown Dwarfs"**

The probable existence of planet nine in our Solar System year led to the inception of the Backyard Worlds project led by NASA scientist Dr. Marc Kuchner in 2017. The aim was primarily to encourage volunteers to distinguish real celestial objects from image artefacts in data from NASA's Wide-field Infrared Survey Explorer (WISE) mission. The real objects are brown dwarfs and low-mass stars, the Sun's nearest neighbours.

Club Speaker – Peter Jalowiczor



Thursday, 15th Mar **"How Astronomers control your life"**

The women who discovered the stars - At the beginning of the 20th century, a group of women known as the Harvard Observatory computers helped revolutionize the science of astronomy.
Brad Gibson is the Director of the E A Milne Centre for Astrophysics, University of Hull

Speaker – Prof. Brad Gibson



Thursday, 22nd Mar **"MSAS Annual Imaging Competition"**

Get your entries in ready now!

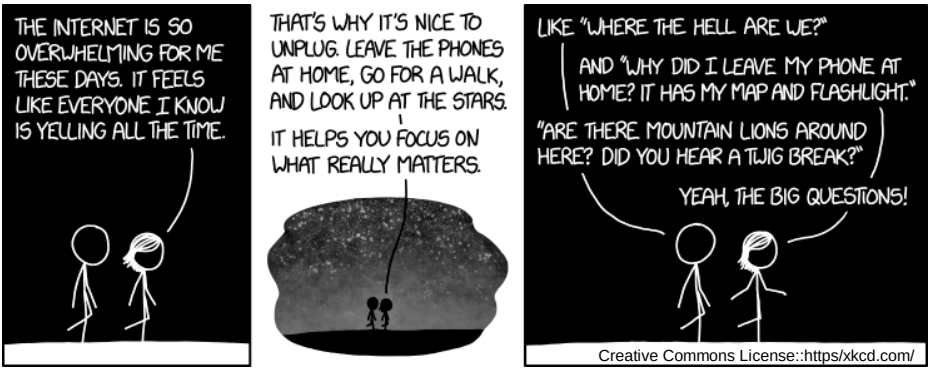
Compere – Tony Morris



Thursday 7th December **"The European Extremely Large Telescope"**

With a primary mirror of diameter 39m, the European Extremely Large Telescope (E-ELT) will be the world's largest telescope operating in the visible to infrared wavelength range. The E-ELT will collect 13 times more light than the largest telescopes. The E-ELT is already under construction, with first light planned in 2024.

Speaker Prof. Vik Dhillon



Mike Hall's March 2018 Skynopsis



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

1st	Sunrise 06.54, Sunset 17.42; Regulus 0.9deg South of Moon, occultation, Moon very low
2nd	Full Moon;
5th	18.00h, Mercury 1.4° North of Venus
8th	Sunrise 06.38, Sunset 17.55
9th	Moon at First Quarter
10th	01.00h Mars 4° South of Moon
11th	02.00h Saturn 2° South of Moon
15th	Sunrise 06.04h, Sunset 18.21h; 15.00h Mercury at greatest elongation, 18°
17th	New Moon
18th	01.00h Mercury 4° North of Venus, 19.00h Venus 4° North of Venus
20th	16.00h Spring Equinox
22nd	Sunrise 06.04, Sunset 18.21 Aldebaran 0.9° South of Moon; occultation, Moon very low
24th	Moon at First Quarter
24t/25th	Change to BST
28th	14.00h Regulus 1° South of Moon
29th	Sunrise 06.48, Sunset 19.34
31st	Full Moon

The Solar System

Mercury	Showing well in the evening
Venus	Bright in the evening sky, very close to Mercury just after sunset on the 5th
Mars	Swelling to 8 arc seconds diameter by the end of the month
Jupiter	Rises before midnight by mid-month
Saturn	Close to Mars after mid-month, lying low pre-dawn in Sagittarius
Uranus	Sinks into evening twilight by end of month
Neptune	Not visible this month

Galactic Goodies M66 (RA: 11h 20m 15s; Dec:+12059'42"), one of the finest spiral galaxies in Leo*;* M44 (RA 08h 40m, Dec 19° 59') Beehive Cluster in Cancer, open cluster with over 200 stars

Look out for the Moon's occultation of Aldebaran on the 23rd. Aldebaran will disappear behind the Moon around 4:20pm (still daylight) and reappear around 5:25pm – you may be able to see the re-appearance with binoculars , it will however be about 1 hour before sunset, so still tricky to see.

The Thoughts of Chairman Les



This is our 40th YEAR as a society

We all need to help celebrate this so give us some ideas of what you would like to be included.
Would you be able to help with any of the organising?
Let any committee member know your thoughts.

This is also the year that we intend to start building the extension to the observatory which is a major project for us. We have recently been successful with a claim to the Lottery and are to advertise the award on the 6th March so we can synchronise our announcement with theirs. We have another application which is outstanding and we are expecting to hear from that in the next few weeks.
As I have mention in these pages before we intend to start on site in May 2018. We will be looking for members or anyone that could help us with the labour force that will be needed. If anyone reading this that is in the building trade that could help us with this project you can contact us on our web site, msas.org.uk, or on Facebook or by phone.
We need to setup a procedure / programme for the site work so we would need any helpers name ASAP please.

Our Solstice / 40 Anniversary dinner is not too far away and we will be requiring you choice of menu and your deposit in the near future please.

Your Chairman

Les Marsden

40th Anniversary Dinner & The Alan Chapman Lecture

Friday 15th June 7:30pm – Rotherham Golf Club

MENU

Homemade Vegetable Soup
Deep Fried Whitebait with Tartar Sauce
Melon with Seasonal Berries
****
Thick Cut Braising Steak served with Yorkshire Pudding
Chicken Breast served in a White Wine & Mushroom Sauce
Darne of Salmon with Hollandaise Sauce
Cheese & Spinach Cannelloni
****
Lemon Tart with a Raspberry Coulis
Honeycomb Cheesecake with Cream
Treacle Sponge & Custard
****

Coffee & Mints

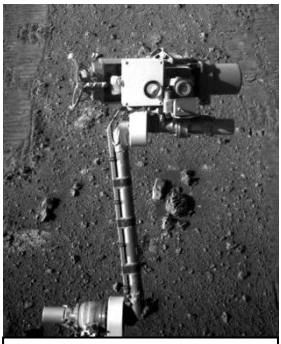
Cost £20 per head, £21:50 if booked on line

Opportunity takes a Sol 5000 "selfie"

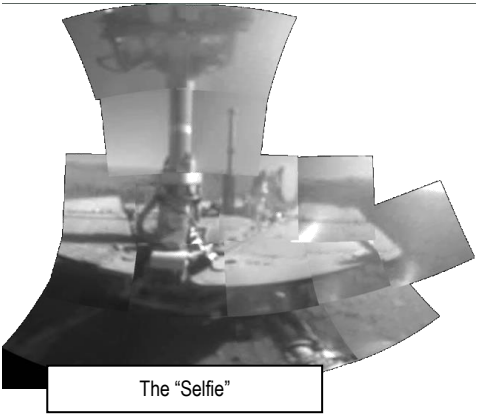
Opportunity Rover, also known as MER-1, was launched on July 7th 2003, it landed and deployed on Meridian Planum on Mars on January 25th, 2004.That amazing little robot was originally scheduled to last just 90 Martian days on the surface, has now reached and passed it's 5,000 Martian day! It has also just passed 14 (YES _ FOURTEEN!) years trundling about the Martian surface, travelling over 45 kilometers over that time. What an wonderful achievement. Sol 5,000 occurred on Friday February 16th 2018 at 1.20am GMT.



The on board camera's recorded dawn on its 4,999th morning. So on the 5,000th day the MER (Mars Exploration Rover) controllers turned the "Microscopic Imager" used for photographic close-ups of rocks to face the rover and they took a series of photographs, first of the Microscopic Imager, then from the MI itself looking back at the rover.

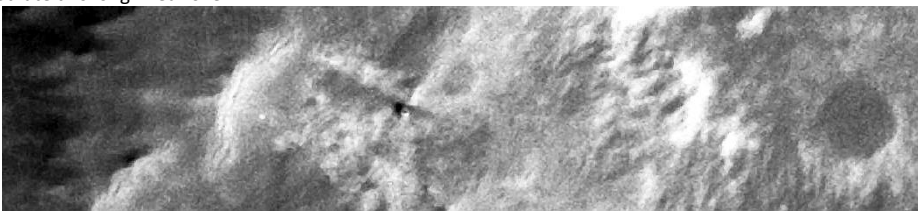


Microscopic Imager



The "Selfie"

Since 2011 the rover has been exploring the surrounding of Endeavor crater which is a 22 kilometer diameter crater, estimated to be 3.6 billion years old. The picture below is a photograph of Opportunity from the Mars Reconnaissance orbiter from 3 years ago – maybe they will take another one soon to celebrate this long-lived rover.



BRAVE NEW WORLDS

It is not often that the invitation to be listed as co-discoverer of four new exoplanets is offered. For this amateur Astronomer this opportunity arose in September 2010 with the Lick-Caringerie Planet search team – and came as a result of years of collaborative research.

INTRODUCTION

At the time of writing hundreds of exoplanets have been catalogued and the number is continually increasing into the thousands. Many, are now part of exotic multi-planet systems and Astronomers are coming ever closer to discovering a planet, which resembles our own earth. This is a specialized and expanding area of Astronomy that is relatively new with the first discovery of an exoplanet proper being only in 1995; or 1992 if you include the pulsar planets. There are many different detection methods utilised by Astronomers with the Radial Velocity technique, which measures the wobble that an unseen planet induces in the star currently being by far the most productive detection and characterization method, accounting for over 90% of all the current detections. Since stars are incredibly far away and no telescope yet built can directly see their discs let alone the discs of any planets going around them. Therefore, indirect methods of detection are devised as direct imaging is still in its infancy.

RESEARCH

Modern Astronomy has evolved from the old days of Astronomers who used to spend many hours freezing at the end of large telescopes. In these times professional Astronomers often remotely operate telescopes at other ends of the world and usually from warm computerised rooms! Data is collected, which may be analysed at a later period. In this case, monitoring large numbers of nearby stars over many years using precise instruments yields impressive data sets for each respective star. In 2005, scientists at the Department of Astronomy & Astrophysics, University of California, Santa Cruz, USA (UCSC) set-up a collaborative project for Astronomy enthusiasts from all corners of the globe. Approx 1,400 Members were registered at the peak of the project in 2009, which has now closed. The Systemic Project offered access to actual Exoplanets data. The object here was not so much on actual detections but more on the detection thresholds. That is how strong does a signal (caused by a planet) had to be before it is detected. For myself, this forever changed evenings by the PC and, at the time I don't think I realised just how much this was going to be a large part of my life. In March 2007, I registered as a member and processed over 1,000 models of systems – eventually securing second spot in the members' hall of fame. The Systemic Project involved downloadable software utilised by professional Astronomers in the form of a downloaded console (it is still available on www.oklo.org). The software analyses Radial Velocity data sets (as mentioned earlier), which may reveal the presence of a planet. The project led to my contact with scientists at UCSC and this slowly developed into research collaboration. Being a former postgraduate at the Department of Physics, University of Sheffield it was a deja vu in many respects but difficult and constraining (to try to get to the standard that I would like) having a full-time job and family as well.

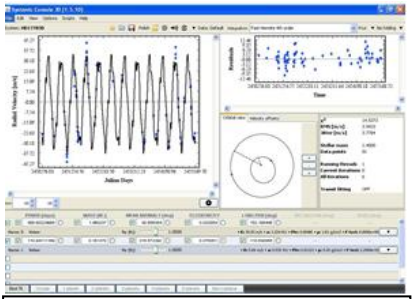


Fig 1. The software displaying the HD177830 planetary system: the new planet is in the inner orbit.

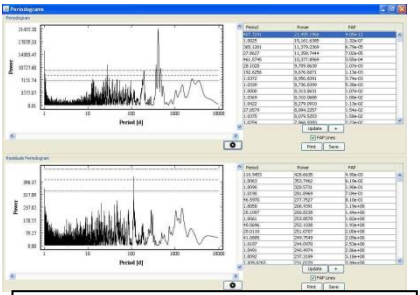


Fig 2. The software displaying the peaks in the HD177830 system – periodograms.

It took quite a while before the concepts behind this new field sank in. From May 2008 - I started to submit reports of potential candidates utilising the software. This including reporting on various aspects on the performance of the software (the console) as I developed my own tests and submitted the results back to the States.

RESULTS

The first Systemic paper was published in Aug 2009. This paper summed up the research efforts of the participants in this project and lists well-known US Academics in this field. December 2009 proved to be quite different as one of the candidates I'd submitted was confirmed. Returning home from work on midday, Christmas Eve, that afternoon was spent preparing a batch of candidates to be sent to UCSC. One of the candidates stood out. After a number of e-mail exchanges with Prof. Greg Laughlin a planet around HD 177830 was confirmed. I also received an expanded data set from the UCSC, which more clearly showed the existence of the planet in this system. This one had been on UCSC's hot list, and the timing was impeccable. This is one Christmas present that I shall not forget for the rest of my life!

The following year, 2010 came another milestone, when I was officially invited by Prof. Laughlin to be listed as co-author of a paper, which the Lick- Carnegie Planet Search team was finalising for publication.

"*I'd like to invite you to be listed as a co-author on a paper that the Lick-Carnegie planet search team is currently finalizing for publication. This paper describes several new planets, including one orbiting HD 99492. The solution is based on the addition of new data, and differs substantially from yours in the period, but your work was very useful in terms of identifying systems of interest. Even more importantly, you provided a great deal of useful feedback on the console. This paper was effectively generated in full by the console's analysis and its associated paper-writing routines. If you'll accept co-authorship, and I hope you will, I'll send you the latest (near-final) draft of the paper.*"

Prof. Greg Laughlin, UCSC, September, 2010.

Adding data: RV measurements means that signal peaks in the data may change; what might have looked as a planet at a given orbital period, will have its 'year' changed with the new data. It is rather like adding pixels to an image, you can see more clearly.

The (second) paper featuring the four new Exoplanets, was published in November 2010 in the Astrophysical Journal.

Table 1. The Properties of the New Planets and their Systems.

Parameter	HD 31253b	HD 218566b	HD177830c	HD 99492c
Distance/ lyr	175.4	97.6	192.4	58.6
Luminosity$_{star}$ (L_{sun}=1.0)	3.29	0.35	4.84	0.42
Distance/au	1.26	0.70	0.51	5.20
Period/ d	466.0	225.7	110.6	4,697
Minimum Mass /Me (Msin I)	159.0	66.8	47.7	114.5
Orbital eccentricity/ e	0.3	0.3	0.3	0.1

All the new planets are gas-giants and the convention follows that the new candidates are named with the usual style of allocating ascending letter names starting from "b", "c" etc. The table above illustrates their basic properties. The top row compares the luminosities of their parent star (compared to the Sun). Next, the distance from the star (au), followed by the period/ days, their mass, and e. One however stands out, namely: HD218566b, which lies in the HZ of the system and is also the 500th extrasolar planet to be listed!

Peter Jalowiczor

Diary

Date	Time	Location	Subject / Event	
Thu Mar 1st	**19:45**	**Club Room**	**Astronomy & Space News**	*Various*
Thu Mar 8th	**19:45**	**Club Room**	**Backyard Worlds**	*Peter Jalowiczor*
Wed Mar 14th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Mar 15th	**19:45**	**Club Room**	**How Astronomers Control Your Life**	*Prof Brad Gibson*
Sat Mar 17th	**17:30**	**Old Moor RSPB**	**"Nature and the Night Sky" (PO)**	*Les & Phil*
Thu Mar 22nd	**19:45**	**Club Room**	**Annual MSAS Astroimaging Comp**	*Tony Morris*
Fri Mar 23rd	**19:45**	**Observatory**	**Public Viewing Evening**	*Les Marsden*
Mon Mat 26th	**19:00**	**Observatory**	**Visit by Chapeltown Scouts**	*Jez Robinson*
Thu Mar 29th	**19:45**	**Club Room**	**Deep Sky Observing; Equipment & Techniques – Part 2**	*Tony Morris*
Thu Apr 5th	**19:45**	**Club Room**	**TBA**	*TBA*
Wed Apr 11th	**20:00**	**Club Room**	**Executive Committee Meeting**	
Thu Apr 12th	**19:45**	**Club Room**	**Astronomical Videography**	*Mick Nicholls*
Thu Apr 19th	**19:45**	**Club Room**	**European Extremely Large Telescope**	*Prof. Vik Dhillon*
Thu Apr 26th	**19:45**	**Club Room**	**Deep Sky Observing; Equipment & Techniques – Part 3**	*Tony Morris*

(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

