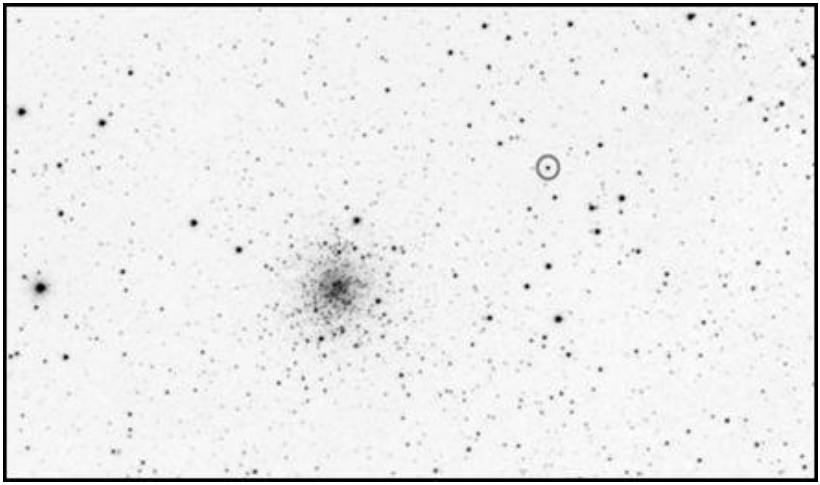
The Messenger

Mexborough & Swinton Astronomical Society

May 2014

Rosetta sets sights on destination comet

ESA's Rosetta spacecraft has caught a first glimpse of its destination comet since waking up from deep-space hibernation on 20 January.
This image was taken with the comet appearing close to the bright globular star cluster M107. The image was taken from a distance of about 5 million kilometers from the comet.
Rosetta is due to begin maneuvers to bring it into orbit around the comet 67P/Churyumov-Gerasimenko this month, with an expected arrival date in August. Rosetta will then deploy a lander to attach itself to the comets surface.
Comet 67P is one of numerous short period comets which have orbital periods of less than 20 years and a low orbital inclination. Since their orbits are controlled by Jupiter's gravity, they are also called Jupiter Family comets. These comets are believed to originate from the Kuiper Belt, a large reservoir of small icy bodies located just beyond Neptune. As a result of collisions or gravitational perturbations, some of these icy objects are ejected from the Kuiper Belt and fall towards the Sun. Like all comets, it has a fairly small, solid nucleus which is thought to resemble a dirty snowball.
The density of the nucleus seems to be much lower than that of water, indicating a loosely packed or porous object. Like other comets, its nucleus is generally blacker than coal, indicating a surface layer or crust of carbon-rich organic material.



The Thoughts of Chairman Les



I'd like to let you know of just one important item of very hard work that your committee has undertaken for the past few years in particular, I say committee but its just a couple of people really.
As most our members will know our society have been presenting our accounts to the Charities Online Financial Reporting Awards (COFRA) for some years now. This award scheme is overseen by The Institute of Chartered Accountants in England and Wales (ICAEW) in London. Winners and runners up received prize money for their charity, a winners or runners up seal for their website and free annual subscription to ICAEW's Charity and Voluntary Sector Group. All charities short listed for the Awards are given free places to attend the evening with their key stakeholders.
Our first submission was in 2008 when we were runners up, from the feedback that we got from that submission guided us to make a better job of our next attempt which was the following year, 2009, when we took first place which was an outstanding achievement for us. The press release put out by The Foundation was very good for the moral of the whole society. The following year, 2010, we shared first place with the Chesterfield Philharmonic Choir, we found ourselves in the same situation in 2011 and 2012 when in both years we were beaten to the runners up position again by the Aberdeen Strathspey & Reel Society. We just couldn't seem to get past the Scots as in 2013 we were joint winners with the Aberdeen Strathspey & Reel Society and received £2,250 which helped our funds enormously, we have in fact took a cash prize on each of the above mentioned years.
After our secretary has made many enquiries to the ICAEW's offices we are told that the awards will not be taking place this year, 2014.
The Committee Officers that are involved with this work cannot be blamed if they feel a bit relieved at this news because it is not an easy task and they are due a rest.
I'm sure that when the awards are up and running again we will indeed offer our accounts for their scrutiny.

I wish you clear skies

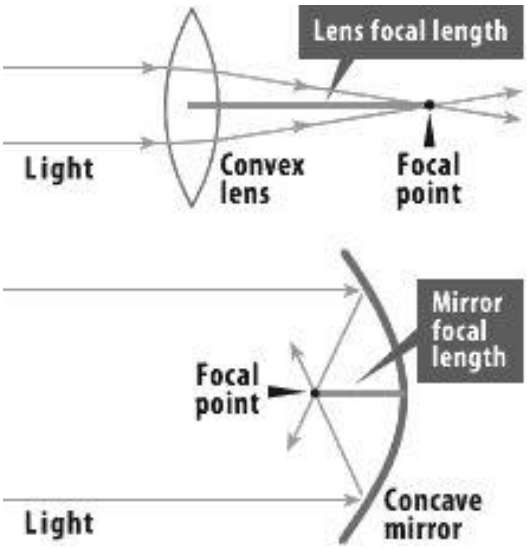
Les Marsden FRAS

Chairman

How do you determine a telescope's magnification?

The magnification of a telescope changes as the eyepiece is changed. Magnification is dependant on the focal length of your telescope and the focal length of the eyepiece. Generally expressed, focal length of the telescope is the distance (given in millimeters) between the telescope's primary lens or mirror and the point where the light rays come together in focus. Why is this important? Focal length is the major determining factor of any given telescope's magnifying power. You might think that using a lot of magnification would be a bonus when looking at a small object, but all telescopes have a practical limit. At lower magnifications, the image is small, bright and well-resolved, but too much magnification makes for nothing more than a big, blurry image. Why? Telescopes can only gather so much light and high magnification means you're just spreading that same amount of light over a larger area - resulting in useless or "empty" magnification. So how do you determine a telescope's practical magnification limits? It's easy. Just multiply the objective lens or mirror's diameter (in millimeters) by 2. For example, a 100mm telescope would have a practical magnification limit of 200X.

Now that you understand the importance of your telescope's focal length, you can determine the magnifying power of any eyepiece you use in it. All it takes is a little math. Take a close look at your telescope's eyepieces and you'll see they also have a focal length. It is usually printed on the barrel and it is also expressed in millimeters. All you need to do is divide the focal length of the telescope by the focal length of the eyepiece For example, if you have a telescope that has a 1000mm focal length and you are using a 20mm eyepiece, you will be getting 50X (1000mm/20mm = 50X). If you place a 20mm eyepiece in a telescope with a 500mm focal length, you'll get 25X (500mm/20mm = 25x). That is why the same eyepiece appears to behave differently in different telescopes! As we learned earlier, there are practical limitations to a telescope's magnifying power, so choose, and use your eyepieces by focal length accordingly.



100 years ago – Events of 1914

Robert Goddard begins building rockets. In 1914, his first two landmark patents were accepted and registered. The first, U.S. Patent described a multi-stage rocket. The second, U.S. Patent described a rocket fueled with gasoline and liquid nitrous oxide. The two patents would eventually become important milestones in the history of rocketry. In the fall of 1914, Goddard's health had improved, and he accepted a part-time position as an instructor and research fellow at Clark University. His position at Clark allowed him to further his rocketry research. He ordered numerous supplies that could be used to build rocket prototypes for launch and spent much of 1915 in preparation for his first tests. Goddard's first test launch of a powder rocket came on an early evening in 1915 following his daytime classes at Clark. The launch was loud and bright enough to arouse the alarm of the campus janitor, and Goddard had to reassure him that his experiments, while being serious study, were also quite harmless. After this incident, Goddard took his experiments inside the physics lab, in order to limit any disturbance.

At the Clark physics lab, Goddard conducted static tests of powder rockets to measure their thrust efficiency. He found his earlier estimates to be verified; powder rockets were converting only about 2 percent of their fuel into thrust. At this point he applied de Laval nozzles, which were generally used with steam turbine engines, and these greatly improved thrust efficiency. By mid-summer of 1915, Goddard had obtained an average thrust efficiency of 40 percent with nozzle velocities of 2051 meters per second. Connecting a combustion chamber full of gunpowder to various converging-diverging expansion nozzles, Goddard was able in static tests to achieve engine efficiencies of more than 63% and exhaust velocities of over 7000 feet (2134 meters) per second. Few would recognize it at the time, but this little engine was a major breakthrough. These experiments suggested that rockets could be made powerful enough to escape Earth and travel into space. This engine, and subsequent experiments sponsored by the Smithsonian Institution, were the beginning of modern rocketry and, ultimately, space exploration. Goddard realized, however, that it would take the more efficient liquid propellants to reach space.

Later that year, Goddard designed an elaborate experiment at the Clark physics lab and proved that a rocket would perform in a vacuum such as that in space. He believed it would, but many other scientists were not yet convinced. His experiment demonstrated that a rocket's performance actually decreases under atmospheric pressure.

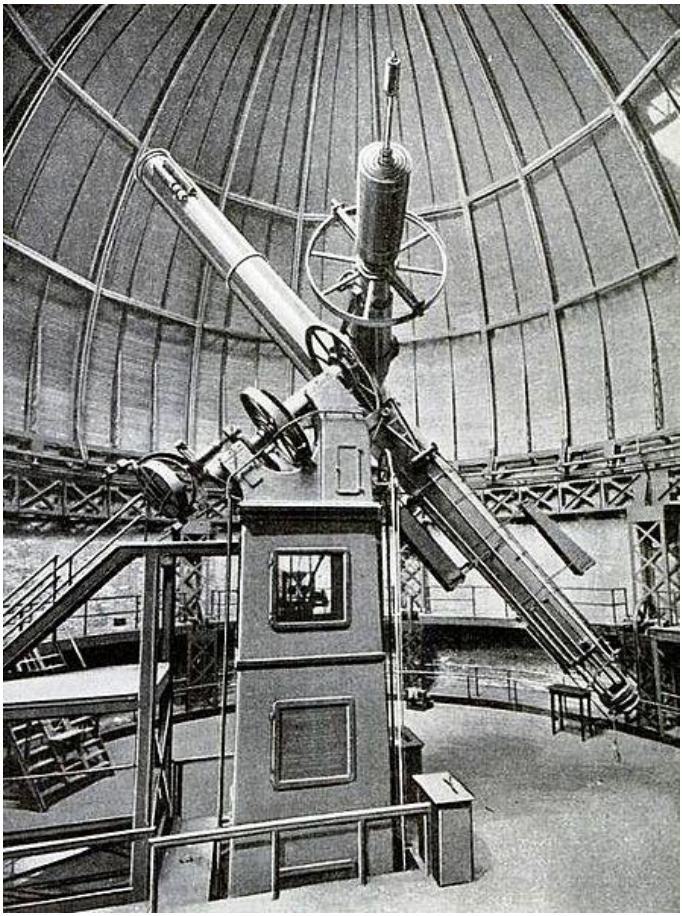
From 1916 to 1917, Goddard built and tested experimental ion thrusters, which he thought might be used for propulsion in the near-vacuum conditions of outer space. The small glass engines he built were tested at atmospheric pressure, where they generated a stream of ionized air.

Walter Sydney Adams determines an incredibly high density for Sirius B. Adams was born in Antioch, Syria to Lucien Harper Adams and Nancy Dorrance Francis Adams, missionary parents, and was brought to the U.S. in 1885. He graduated from Dartmouth College in 1898, then continued his education in Germany. After returning to the U.S., he began a career in Astronomy that culminated when he became director of the Mount Wilson Observatory.

His primary interest was the study of stellar spectra. He worked on solar spectroscopy and co-discovered a relationship between the relative intensities of certain spectral lines and the absolute magnitude of a star. He was able to demonstrate that spectra could be used to

determine whether a star was a giant or a dwarf. In 1915 he began a study of the companion of Sirius and found that despite a size only slightly larger than the Earth, the surface of the star was brighter per unit area than the Sun and it was about as massive. Such a star later came to be known as a white dwarf. Along with Theodore Dunham, he discovered the strong presence of carbon dioxide in the infrared spectrum of Venus
Sinope, the outermost known moon of Jupiter, is discovered by Seth Barnes Nicholson at Lick Observatory while observing the recently discovered Jupiter moon Pasiphaë, he discovered Sinope, whose orbit he computed for his Ph.D. thesis in 1915.

A 76 cm refracting telescope is built at Allegheny Observatory in Pittsburgh, Pennsylvania. It is the fifth largest refractor in the world. See picture.



Moonlighting

as Mr. Jobstock, and Mrs. Lang as Mrs. Jobstock's maid, were particularly good; whilst Mrs. Lucena, as Fanny, the niece was very pleasing. Mr. Alan Birch's banjo songs fairly convulsed the listeners in the second part of the programme, and Mr. Lucena well main

(Surrey Mirror - Saturday 18 February 1893)

NEXT WEEK

PADIHAM Town Hall

LOOK! LOOK! LOOK!

COMMENCING SATURDAY, OCTOBER 17th

Here is it, Dancers! The event everyone has been waiting for. Norman Douds Presentations are pleased to announce the GALA RE-OPENING of the Wonder Ballroom of the North-West for Saturday night dancing, commencing Saturday, Oct. 17th, and present the PERSONAL APPEARANCE of

LES MARSDEN, HIS PIANO ORCHESTRA and VOCAL STARS

Dancing 7-30 p.m. to 11 p.m. Refreshments. Terrific Spot Prizes, etc.
Doors open 7-15 p.m. ADMISSION 2/6

The crowds are coming from near and far, so join the happy hundreds laughing, singing and dancing their way into the jolliest dance in North-East Lancashire

(14 October 1953, Burnley Express)

BAD ADVERT DEPARTMENT



Trevor Worrall's May Skies

All month: Jupiter visible as bright star low above North Western horizon at end of evening twilight. Jupiter is very bright in the evening sky, setting in the late evening. On the evening of 4 May, the moon is nearby.
Mars, less bright than Jupiter, is now moving slowly away from Earth, and is growing a little fainter day by day, but is still a prominent object for most of the night, setting in the early hours. On the evening of 11 May, the moon is nearby.
Saturn comes to opposition and it's nearest to Earth this orbit on 10 May amongst the faint stars of Libra. It is 1330 million kilometres or 74 light minutes from Earth. Its rings are well on display, and the planet is a wonderful sight through a decent telescope. The full moon is close to Saturn on 14 May, and occults it over Australia

7 May 2014: Eta Aquarid meteor shower peaks. A zenith hourly rate of 55 is forecast to be visible under ideal conditions. The dust that creates the meteors you observe originate from Halley's Comet.

7 May 2014: First Quarter Moon

11 May 2014: Saturn at opposition. Saturn is directly opposite the Sun as seen from Earth, and will rise in the East as the Sun sets in the West. The months around the time a planet reaches opposition are the best time to view 'superior' planets as it is the time that they are closest to the Earth. Saturn shines at magnitude +0.1.

14 May 2014: Full Moon

21 May 2014: Last Quarter Moon

24 May 2014: Comet 209P/LINEAR meteor shower? You may see the birth of a new meteor shower produced as the Earth passes through large dust particles left behind by the passage of Comet 209P/LINEAR. Any meteors that occur will appear to come from the constellation Camelopardalis, the Giraffe

29 May 2014: New Moon

MAY PUZZLE – The Chicken and the Leg!

A farmer has a number of chickens and some cows for a total of 30 animals, and the animals have 74 legs in all. How many chickens does the farmer have?

Programme for May & June 2014

Date	Time	Location	Subject & Speaker
Thu May 1st	19:45	Club Room	**"Solar Observing"** *Mick Nicholls*
Thu May 8th	19:45	Club Room	**"Astro Clinic"** *Paul D'Silva*
Thu May 15th	19:45	Club Room	**"Our Active Sun"** *Prof Philippa Browning*
Thu May 22nd	19:45	Club Room	**"Summer Sky"** *Trevor Worrall*
Thu May 29th	19:45	Club Room	**AGM**
Sun June 1st	Noon	Hoober Observatory	**Solar Observing**
Thu June 5th	19:45	Club Room	**" To be Confirmed"** Dev Das
Thu June 12th	19:45	Club Room	**"Back to Basics"** *Paul D'Silva*
Fri June 13th	19:45	Club Room	**"To Be Confirmed"** *Dr Alan Chapman*
Sun June 15th	Noon	Hoober Observatory	**Solar Observing**
Thu June 19th	19:45	Club Room	**"Manchester's First Rocket Man"** *Kevin Kilburn*
Thu June 26th	19:45	Club Room	**"Britain in Space"** *Mike Hall*

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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April's Puzzle Answer

Les has two cubes (like dice) on his desk, with a single digit on each face. Every day he arranges both cubes so that the front faces show the number (date) of the current day of the month. What numbers are on both cubes to allow this?

Both dice have 0, 1, and 2 on them, one dice then has 3, 4 and 5. The other has 6, 7 and 8.
Dice 1 : **0 1 2 3 4 5** Dice 2 : **0 1 2 6 7 8**
To get the "9" turn 6 upside down!