The Jeety Starn

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Welcome to Issue 2 of *The Jeety Starn*, the quarterly newsletter of the Stirling Astronomical Society (SAS). We aim to present information related to our Society and Telescope, observations and articles by Society members and by guest contributors, and other items of interest to amateur astronomers. Included in this issue you will find an article on the prospects for travel beyond our solar system, the story of an ancient astronomer-priestess, our regular set of poetic quotes with cosmological significance, and the first part of a series, *The Sky in Scots*, which, with some leeway, describes the heavens as our Scots forebears may have done.

Prospects for Interstellar Travel

By Chris Davis

Humanity has met seemingly insuperable exploratory challenges: finding the other side of the great oceans; sailing right around the planet; putting men on the moon. All seemed impossible until we developed the necessary sophisticated technologies: sailing ships; diesel powered propulsion; rockets for space.

Rockets have indeed got us to the moon, and eventually they could get us to the next planet, Mars. What seems impossible is getting to the next star by rocket before the crew perish of boredom, if nothing else. It is estimated that even the peak of chemical rocket technology would take at least twenty years to get humans across the 4.25 light years of space to our nearest star, Proxima Centauri (the two other stars in the system, Alpha Centauri A and B, are approximately 4.35 light years distant). The difficulty of maintaining human life so long isolated in space is immense. Recycling a supply of fresh water for twenty years is feasible, but recycling foodstuffs for so long is questionable. It would, for example, need a lot of energy, because the craft would be too far from both suns to support natural food growth by photosynthesis. It is conceivable that energy could be supplied by an onboard "sun", that is, a hydrogen fusion reactor. Such devices are indeed under development, and may one day be compact enough to fit in a space rocket.

Surprisingly, genes active in hibernation in animals that hibernate have been found in the human genome, which suggests that the classic of science fiction, suspended animation for long space flights, could become a reality for specially-bred humans.

The possibility of fusion power on board a rocket immediately suggests fusion-powered propulsion. One option could be to employ the copious energy from fusion to accelerate jets of particles to relativistic mass-increasing speeds. These could propel rockets most efficiently up to high velocities, cutting journey times using the minimum of propellant matter (which would have to last for the rocket turnaround and the return journey to Earth). But relativistic particle accelerators are currently great, heavy, ground installations (e.g. the Large Hadron Collider), and dissimilar to rocket motors.

Will there ever be anything like the fictional Star Trek "warp drive" we ask? A multi-solar mass black hole could probably warp space-time, but it is hardly convenient for space travel. In conclusion, therefore, interstellar travel remains but a dream.

En Hedu'anna of Ur

By Sandi Cayless

En Hedu'anna is the first scientist mentioned by name in ancient history and whose writings have survived. She lived around 2354 BCE and was the chief astronomer-priestess of the ancient city-state of Ur. Ur was in Sumer, the earliest known civilization in the historical region of southern ancient Mesopotamia (now south-central Iraq) and within the Fertile Crescent situated between the Tigris and Euphrates rivers.

The Sumerians were an advanced, educated people. With canal irrigation necessary, they were expert planners and engineers, used water clocks to control flooding and cropping, and they developed mathematics (necessary for taxation!) that included decimal notation and the base 60 system – sixty seconds in a minute, sixty minutes in an hour, a 360 degree circle – mathematical tables, and quadratic equations. They also controlled political and economic life by means of temple-communities, with priest/priestess overseers. The Sumerian cuneiform writing system (from Latin *cuneus* = wedge), learned in specialist schools by male *and* female scholars, is the oldest known and was marked on clay tablets using a reed stylus.

En Hedu'anna's father, the Akkadian Sargon, took control of the Sumerians about 2234 BCE, making himself ruler. Militaristic, he was one of the earliest commanders to use chariots in combat and is believed to have organised the first standing army in history (Howard 2017). He also took control of Akkadian and Sumerian religion, and made his only daughter En Hedu'anna head priestess (or En-Priestess) of the temple of the moon god Nanna at Ur (Kriwaczek 2012). This was not her name at birth, but an official title, and is inscribed in existing cuneiform tablets (Howard 2017). The **En** means *ruler*, the **Hedu** *ornament* and **Anna**, *of heaven* (Kriwaczek 2012). Evidence of her existence was found by the archaeologist Leonard Woolley in 1927 – an alabaster disc inscribed on the back:
Enheduana, Zirru Priestess of the god Nanna, wife of the god Nanna, child of Sargon, King of Kish… made an altar and named it 'Dais, Table of Heaven'.
She is shown on the reverse engaged in religious duties with three lesser figures. Other seals and impressions found provide further evidence of her life and work.

As chief astronomer-priestess of Ur, En Hedu'anna managed the great temple complex, the agricultural work around the temple and the activities related to the religious year. She also composed an amazing body of spiritual work that has been copied, recopied, and used as a model for other such works for almost 2,000 years. Translations exist of forty two temple hymns, three long poems to Inanna (goddess of the sun, identified with the warrior-goddess Ishtar), and three poems to Nanna (god of the moon). Her poetry comprises the first scripted form of a religious belief system, and she was known as the Shakespeare of the ancient world, as her works were studied and recited for over 500 years after her death (Fryner-Kensky, 1993). She was the first identifiable author in history (Kriwaczek 2012). Her hymn number eight shines a light on her other talents (Howard 2017):
The true woman who possesses exceeding wisdom,
She consults a tablet of lapis lazuli
She gives advice to all lands...
She measures off the heavens,
She places the measuring-cords on the earth.

The Sumerians used the moon to track time, with each new moon announced by a group of priestesses known as a *synod*, hence the term *synodic month* (29.531 days). With circa 354 days in a lunar year (12 cycles of lunar phases), the lunar calendar did not tie in with the seasonal calendar (which cycles every 365.25 days), and thus astronomy and mathematics were a necessity to keep track. En Hedu'anna is credited with creating one of the first calendars, still in use in some religions to time Easter, Passover, and other events. As En Hedu'anna explains in one of her poems, they tracked the moon to set the calendar in the gi-par, a holy place where they lived:

> *"in the gi-par, the priestesses' rooms,*
> *that princely shrine of cosmic order,*
> *they track the passage of the moon."*

This would have involved keeping precise astronomical records of the lunar phases. Observatories with which to view the stars and the moon existed inside Sumerian religious temples, where, amongst other work, maps were made of celestial movements and eclipses predicted. En Hedu'anna was thus one of the first known astronomers and mathematicians in ancient history, and the first to be recorded in scientific history.

On a lighter note, one of the *Drake II* class starships of Mars Fleet in the book *Sub Martis: Starship* is named in her honour (Cayless 2018).

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Poetic Licence

Astronomical and related phenomena appear (or seem to) in literature ancient and modern. Here is a second instalment of poetic and literary gems that either wholly or partially could be read as having an astronomical bent.

de la Mare, Walter: The Wanderers
Wide are the meadows of night
And daisies are shining there,
Tossing their lovely dews,
Lustrous and fair,
And through these sweet fields go,
Wanderers amid the stars--
Venus, Mercury, Uranus, Neptune,
Saturn, Jupiter, Mars.

Dickinson, Emily: Follow Wise Orion
Follow wise Orion
Till you lose your eye,
Dazzlingly decamping
He is just as high.

Dickinson, Emily: Lightly Stepped a Yellow Star
Lightly stepped a yellow star
To its lofty place,
Loosed the Moon her silver hat
From her lustral face.
All of evening softly lit
As an astral hall —
Father, I observed to Heaven,
You are punctual.

Eddington, Sir Arthur
Oh leave the Wise our measures to collate.
One thing at least is certain, light has weight.
One thing is certain and the rest debate.
Light rays, when near the Sun, do not go straight.

Frost, Robert: Canis Major
The great Overdog,
That heavenly beast
With a star in one eye,
Gives a leap in the east.

He dances upright
All the way to the west
And never once drops
On his forefeet to rest.

I'm a poor underdog,
But tonight I will bark
With the great Overdog
That romps through the dark.

Harris, Sidney: in *American Scientist* magazine, 1975
Space is big
Space is Dark
It's hard to find
A place to park

The Sky in Scots 1: Phenomena

By Sandi Cayless

(The terms below have mainly been culled from the Dictionaries of the Scots Language (*Dictionars o the Scots Leid*), online at: www.dsl.ac.uk/)

Phenomenon	Scots Name(s)
Alcor in Ursa Major*	Jack beside the middle horse*
Any bright heavenly body	Blinker (taboo fisher word)
Any sparkling star	Jeety Starn
Apparent standing still of a planet at apogee and perigee	Stationeir
Arcturus	Laid-Star; Leidar-star
Ashen glow	Auld mune (meen) in the airms o' the new
Aurora Borealis	Merry-dancers; Pretty-dancers; Streamers; Northern lights; North-light; Lord Derwentwater's lights
Clockwise E to W, i.e. following the sun	Sungaets
Comet	Harie Star
Comet with a tail	Fierier Bissome
Conjunction of heavenly bodies	Conjunctioun
Crescent moon	Cressand
Daybreak	Skybrack
Eclipse	Obfusk
Full moon	Clear o' the mune (meen)
Gleam of sunshine	Sun-blink
Halo around the Moon	Mune (meen)-broch
Halo around the sun	Sun-broch
Harvest moon	Michaelmas mune (meen)
Inclination	Inclinacioun
Lyra, the three bright stars in	Ellwan' o' Starrs
Mars	The Reid Starn
Meteor, Shooting Star	Shot or Shotten Star, Star-glint; Fire-flaucht
Milky Way (Galaxy)	The White Strip
Moon	Mune; Meen
Moon's last quarter	Auld o' the mune (meen)
Near-new moon; no moonlight	Dark o' the mune (meen)
Orion's sword	Peter's staff
Planet	Warld
Pleiades	Seven starnes; Brot
Polaris	Pole star; Yule-blinker; Northern Star; Seaman's star
Regulus	Regulus eye
Sirius	Frawart (i.e. adverse) Star; Fervent (i.e. glowing with heat) Star
Starlight	Star-sheen
Sun	Day star
Sunbeam	Sunflaucht
Venus as Evening Star	Gloamin' Star; Vesper; the Evyn Star; Cowslem (cow's + gleam: gleam of Venus in the sky when the cattle are driven home)
Venus as Morning Star	Lucifer; Morrow-star; Daysterne; Jubar Schynand
Waning moon	Cruke o' the mune (meen)

* I take this to be Alcor: "the small star close to the third one in the handle" in the constellation of Ursa Major.

The Astronomers Royal (Part 1)

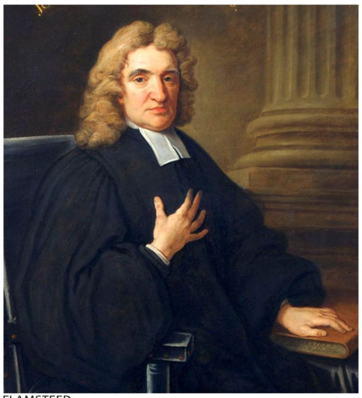
By Mark Butterworth FRS

(This is Part 1 of a four part series by our late, much-missed member, Mark Butterworth FRS, reprinted from the SAS Mercury newsletters of 2005 and 2006, by kind permission of Mrs Pat Butterworth. Illustrations have been amended as appropriate.)

The position of Astronomer Royal (AR) was created by King Charles II in 1675. It is a senior post in the Royal Household and until 1972 it also carried responsibilities as Director of the Royal Greenwich Observatory (RGO). The holder of the post was originally instructed "to apply himself with the most exact care and diligence to the rectifying of the tables of the motions of the heavens, and the places of the fixed stars, so as to find out the so much desired longitude of places for the perfecting of the art of navigation."

Fifteen astronomers have held the position. They represent an interesting group, ranging from some of the most famous astronomers of their time to almost unknown professionals. In a two part (*sic*) article I hope to outline some of the achievements of these astronomers, and hopefully rescue a few of them from complete obscurity. They all held a position of responsibility with generally clearly defined objectives, and even the most famous did most of their "best" work before taking up the post. The office still carries great prestige.

Reverend John Flamsteed, 1675-1719



FLAMSTEED

On his appointment in 1675 the Office of Ordinance provided money for a building and for salaries. The equipment came from donations and was purchased by Flamsteed himself. He laboriously compiled detailed observations of star positions. His most famous achievement was to produce a 3000 star British Catalogue, published after his death in 1725. He made tables of the Sun's motion, measured the latitude of Greenwich, calculated the inclination of the ecliptic and the position of the equinoxes, created tables of

atmospheric refraction and of tidal patterns, and devised a method of observing absolute Right Ascension.

He argued with both Newton and Halley. Halley published a private edition of Flamsteed's observations without his permission. Of the 400 copies of *Historia Coelestis* published, Flamsteed recovered 300 of them and burned them after removing the 97 pages he considered accurate.

Professor Edmond Halley, 1720-1742

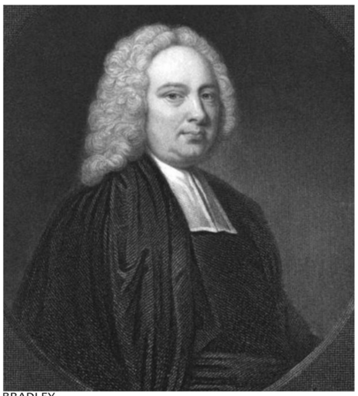
HALLEY

Halley began a degree at Queens College Oxford, but left without graduating to sail with the East India Company to St Helena. There he compiled a 341 star catalogue of the southern skies. He made observations of the transit of Mercury and suggested how these observations might be used to calculate the distance of Mercury and the Sun from Earth. In 1687 Halley persuaded Newton to publish his work, *Principia*. He took over from Flamsteed as AR in 1720 and re-equipped the Observatory with a grant from the Ordinance Survey.

Halley saw his main task as improving the accuracy of lunar tables. These measurements were however lacking in accuracy, and though they were eventually published, their use was limited. Best known for the comet bearing his name, his major achievement as AR was establishing the traditions of pre-planning observations of critical astronomical events.

Dr James Bradley, 1742-1762

In 1721 Bradley took up the post of Savilian Professor of Astronomy at Oxford, encouraged by Halley. Between 1725 and 1726 he worked in a private observatory in Kew where observations of the apparent displacement of Gamma Draconis led him to discover aberration. Between 1727 and 1748 he made observations of the Moon from which he discovered nutation. In 1742 he was appointed AR. As well as completing his work on nutation, he studied Jupiter, specifically its diameter and the eclipses of its satellites. Between 1748 and 1762 he made more than 60,000 observations which were published after his death.

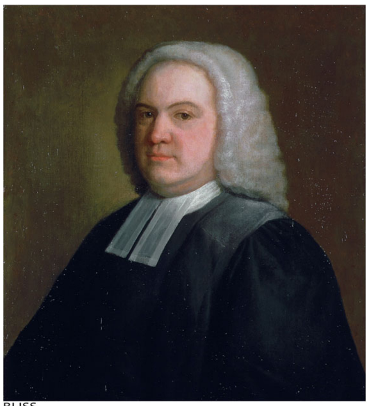


BRADLEY

Bradley re-equipped the Observatory and brought it up to date. The Bradley Transit Telescope Meridian is used by the Ordinance Survey, rather than the Airy Meridian from which GMT is measured.

Nathaniel Bliss, 1762-1764

Bliss worked at the RGO with Bradley and served as AR for two years before his death. In 1761 he made observations of the transit of Venus when Bradley was unable to do so due to poor health. In 1764 he published observations of the annular eclipse visible from Greenwich.

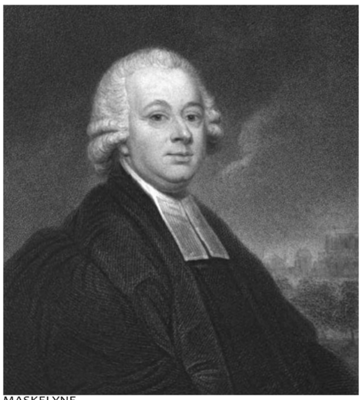


BLISS

Many of his observations were considered potentially useful for solving the longitude problem and were bought by the Board of Longitude from Bliss's widow.

Reverend Nevil Maskelyne, 1765-1811

Maskelyne was assistant to Bradley in 1757. In 1761 he was sent by the Royal Society to the island of St Helena to observe the transit of Venus. Bad weather prevented any useful observations being made, but he used this journey to develop a method of calculating longitude called the lunar distance method. In 1763 the Board of Longitude sent Maskelyne to Barbados to test Harrison's No. 4 timekeeper.

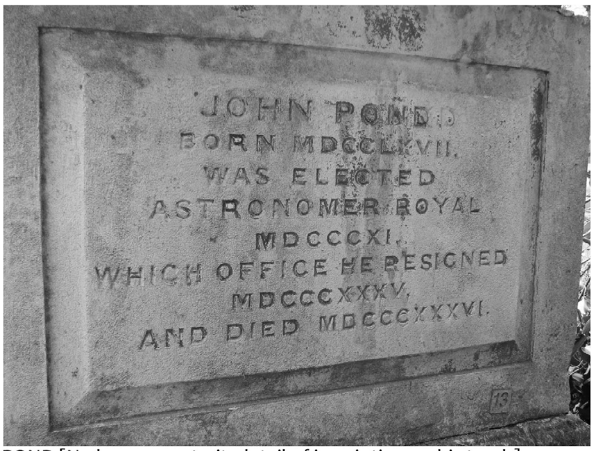


MASKELYNE

In 1767 he produced the first Nautical Almanac which presented results of studies of the Sun, the Moon, the planets and the stars. His time as AR was spent making improvements to existing apparatus and installing new equipment. In 1769 he observed the transit of Venus at Greenwich.

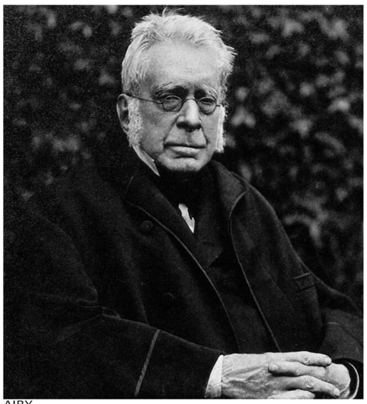
John Pond, 1811-1835

By the age of 15 Pond had already made observations with sufficient confidence to suggest Greenwich data contained a number of errors. In 1798 he established his own private observatory near Bristol. He was able to demonstrate that the quadrant at Greenwich had become deformed with age and was no longer accurate. In 1811 he became AR. He modernised the Observatory, updating and replacing old and damaged equipment, increasing staffing and introducing new programmes. In 1833 he installed the falling time ball service for mariners. Pond produced a new, more accurate catalogue of over 1000 stars (1833).



POND [No known portrait; detail of inscription on his tomb]

Sir George Biddell Airy, 1835-1881



AIRY

The Observatory expanded under Airy. He replaced and added apparatus including the alt-azimuth telescope in 1847 and the Airy transit instrument (providing the Observatory with its fourth meridian line – the line on which GMT is based). He introduced a department for magnetic and meteorological data in 1838. He also introduced photographic registration, an electric device to time transits, spectroscopic observations and daily observations of sunspots using the Kew heliograph. He supervised an experiment to measure the change in the force of gravity with distance below the Earth's surface.

Airy also worked as a scientific advisor to the Government, including giving advice on the laying of a transatlantic telegraph cable and on the construction of the chimes for Big Ben. It was said of him that "Airy was not a great scientist, but he made great science possible."

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John Pond: No known portrait; detail of inscription on his tomb (which he shares with Edmond Halley and Nathaniel Bliss) in St. Margaret's Church, Lee, London.
George Biddell Airy: Photograph of George Biddell Airy in 1891, Morgan & Kidd (Wellcome Collection 12267i).

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A Quote or Two…

Adams, Douglas (1952-2001)

There is a theory which states that if ever anybody discovers exactly what the Universe is for and why it is here, it will instantly disappear and be replaced by something even more bizarre and inexplicable. There is another theory which states that this has already happened.

In the beginning the Universe was created. This has made a lot of people very angry and been widely regarded as a bad move.

Space is big. You just won't believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it's a long way down the road to the drug store, but that's just peanuts to space.

I don't believe it. Prove it to me and I still won't believe it.

Aligheri, Dante (1265-1321)

If thou follow thy star, thou canst not fail of a glorious heaven.

Heaven wheels above you, displaying to you her eternal glories, and still your eyes are on the ground.

Asimov, Isaac (1920-1992)

The most exciting phrase to hear in science, the one that heralds new discoveries, is not 'Eureka!' (I found it!) but: 'That's funny…'

Humanity has the stars in its future, and that future is too important to be lost under the burden of juvenile folly and ignorant superstition.

Barnard, Edward E. (1857-1923)

I have been watching and drawing the surface of Mars. It is wonderfully full of detail. There is certainly no question about there being mountains and large greatly elevated plateaus.

Interesting Asteroids (1)

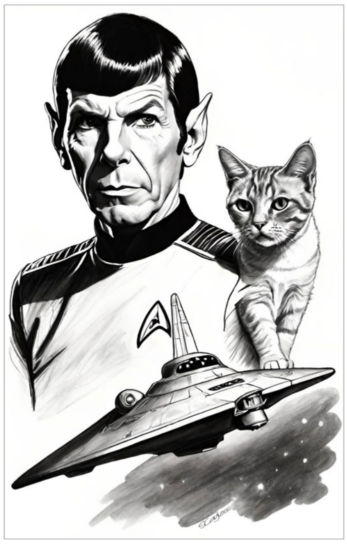
By Sandi Cayless

As part of an occasional series on asteroids of note, the following deals with two main belt objects that are linked by their names: asteroid 2309 Mr. Spock and asteroid 4864 Nimoy. The former has a claim to fame as being the only name of its kind in the history of asteroid nomenclature, with the ruckus the name caused among members of the International Astronomical Union (IAU), the body responsible for approving asteroid names, persisting to this day.

Asteroid 2309 Mr. Spock was discovered by James B. Gibson on the 16th of August 1971, at the Yale-Columbia Station at El Leoncito, Argentina. Mr. Spock is a main belt asteroid, orbiting between Mars and Jupiter at 3 astronomical units from the Sun every 5.23 years. It is approximately 19.7 km in diameter and rotates on its axis every 6.7 hours. Unlike most other asteroids, the naming of this heavenly body caused somewhat of a storm in the IAU, as Gibson did not name it after the fictional Mr. Spock of Star Trek fame, but after his cat. There *are* asteroids after all, that bear fictional names – asteroid 18610 Arthurdent is named for the late, great Douglas Adams' hero of *The Hitch-Hiker's Guide to the Galaxy*, and asteroid 3325 TARDIS bears the name of Dr Who's time-travelling spacecraft.

Mr Spock the cat, a ginger tabby, was "imperturbable, logical, intelligent, and had pointed ears" according to his owner, and was Gibson's companion on the long, dark cold nights of observation during his astronomical expeditions in the United States, Africa, and South America. Gibson had already named asteroids after his wife Ursula and after his home town of Ellensburg, and it was in the lonely observatory in Argentina where he worked from 1971 to 1974, where his cat was often his only companion, that he discovered Asteroid 2309 in 1971, and would name after his pet in 1985. Mr. Spock passed away in 1985, shortly after the asteroid was named for him.

The upshot of the argument was that in 1985, a review panel at the IAU passed a resolution actively discouraging the use of pet names for asteroids; asteroid 2309 Mr. Spock is thus the only asteroid named for a pet. However, the late, highly talented and much-loved actor, director, photographer and singer Leonard Nimoy (1931-2015), who portrayed the pointy-eared half-Vulcan/half-Human scientist



Spock in *Star Trek*, is also remembered on the Final Frontier: asteroid 4864 Nimoy, discovered on the 2nd of September 1988 by H. Debehogne at the European Southern Observatory, was named for him in 2015. As well as portraying an exceptional scientist that encouraged a generation of young people into the sciences, Nimoy contributed to space science, having spoken at the space shuttle Enterprise's landing and narrated a video about NASA's Dawn asteroid mission. Asteroid 4864 Nimoy travels within the main asteroid belt, has an approximate diameter of 9.6 km, and orbits the sun every 3.9 years.

Factual information on both asteroids is listed on the next page.

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Asteroid 2309 Mr. Spock	
Argument of Perihelion (°)	271.81433
Ascending Node (°)	157.17833
Orbital Inclination (°)	10.98092
Orbital Eccentricity	0.0936434
Perihelion Distance (AU)	2.7280809
ΔV w.r.t. Earth (km/sec)	10.8
Semi-Major Axis (AU)	3.0099422
Mean Anomaly (°)	241.26857
Mean Daily Motion (°/day)	0.18874130
Aphelion Distance (AU)	3.292
Period (years)	5.22
Absolute Magnitude	11.47
Phase Slope	0.45
	Data: IAU

Asteroid 4864 Nimoy	
Argument of Perihelion (°)	242.01160
Ascending Node (°)	94.11036
Orbital Inclination (°)	3.61908
Orbital Eccentricity	0.1767619
Perihelion Distance (AU)	2.0322585
ΔV w.r.t. Earth (km/sec)	9.0
Semi-Major Axis (AU)	2.4686156
Mean Anomaly (°)	7.51124
Mean Daily Motion (°/day)	0.25411120
Aphelion Distance (AU)	2.905
Period (years)	3.88
Absolute Magnitude	13.63
Phase Slope	0.15
	Data: IAU

The Moon at First Quarter

By Alan Cayless

Observing the Moon in March and April

The constantly changing Moon

With its ever changing phases, the Moon is a familiar part of our night sky and one of the easiest objects to observe either with the naked eye or through a small telescope. As the Moon orbits the Earth, the angle of sunlight falling on the face of the Moon changes constantly, producing the familiar sequence of phases and revealing different features each night. At full moon sunlight falls directly on the face of the Moon, illuminating the entire disk, but the absence of shadows gives the lunar features a rather flat appearance. Features such as craters can be seen much more clearly a week or so before or after full moon, when the oblique illumination of the Sun casts shadows and increases contrast.

The best times to observe the Moon change with the phases. Shortly after new moon, the thin waxing crescent can be seen in evening twilight. As the month progresses, the Moon rises approximately one hour later each night with the half-moon of first quarter visible in the evening sky, the full moon highest in the sky at midnight, third quarter in the early hours, and the waning crescent in the morning sky just before dawn.

Each phase is also best placed at certain times of the year. The full moon rides high in the winter sky, and is low to the horizon in Summer. First quarter is highest in the spring, and the combination of evening visibility, good illumination and good elevation makes the spring months an excellent time to observe the Moon at first quarter.

The first quarter Moon

At first quarter, the Moon is one week into its monthly orbit around the Earth, and sunlight falls from the right (as seen in the northern hemisphere), creating the familiar semicircular half moon with its righthand or eastern side in sunlight and the left, or western side, in darkness.

The image here shows some of the features that can be seen at first quarter. The upper and central regions are characterised by a number of smooth darker areas – these are the seas (lunar maria) which are vast smooth plains formed from cooled lava outflows. These contrast with the more heavily cratered southern regions (towards the bottom of this image). The first of the seas to appear is Mare Crisium ('C' in the image) close to the eastern limb. To the left, bright rays of ejected material spread out in a distinctive pattern from the crater Proclus. To the south, the multi-ringed Nectaris basin (N) is the result of a massive impact long ago. To the north-west, the slanting sunlight just before first quarter highlights ripples in the floor of Mare Serenitatis (S). Close to the equator, 'x' marks the site of the Apollo 11 landing in the Sea of Tranquility. It can be interesting to look for these features as each of them is revealed on subsequent nights leading up to first quarter.

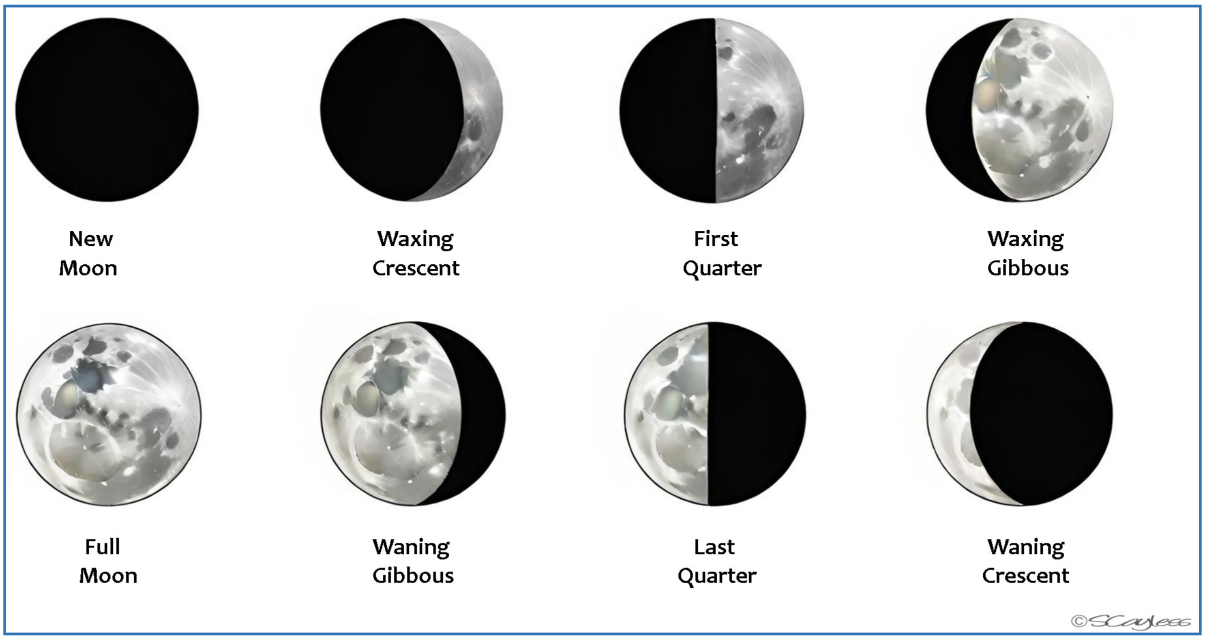
The Moon shortly before First Quarter. 'x' marks the Apollo 11 landing site in the Sea of Tranquility. The other labelled features are described in the text. Image: Alan Cayless, Jan 2024

Best times to observe

First quarter takes place this year on the 17th March and again on the 15th April, so mid-month would be an ideal time to look for the Moon. For a few days before each of these dates a thin crescent Moon will be visible in the early evening sky shortly after sunset. If the sky is clear you may be able to see the crescent in a blue sky before it gets completely dark. Over the next few days after these dates the waxing gibbous phase will be visible later in the evening, leading up to full moon a week later.

To help you plan your observations, details of the Moon's phases and visibility will be published each month on the Society website.

Moon's Phases



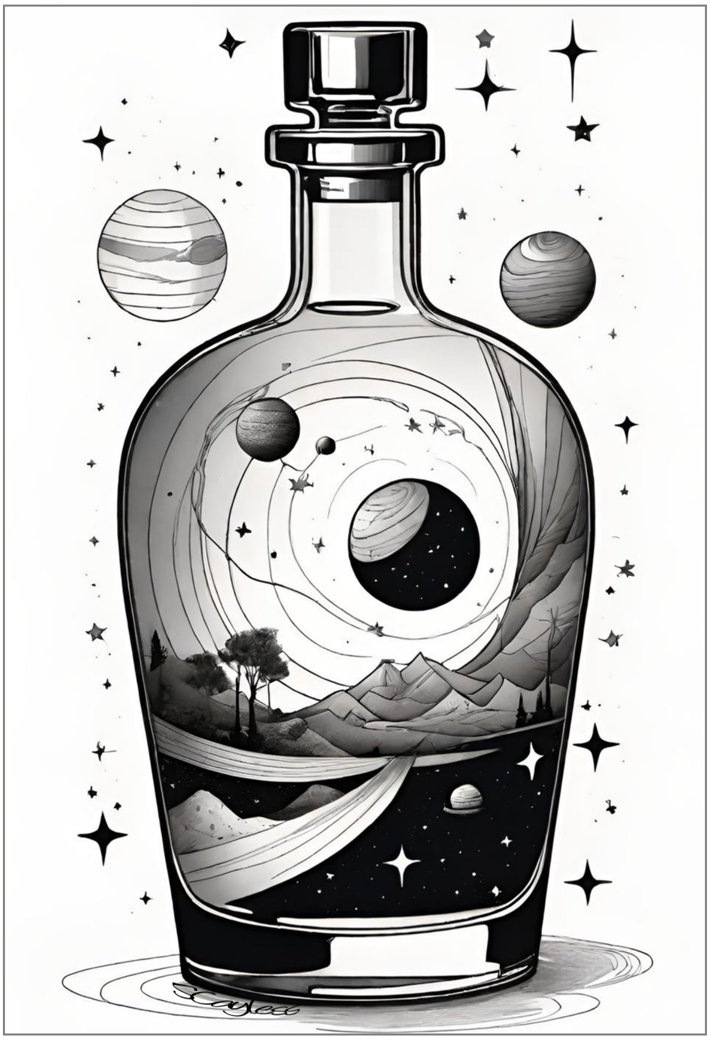
Happy Observing!

The spring equinox on the 20th of March will bring our days and nights to equal lengths, and from then on (in the northern hemisphere!) the daylight hours will extend until the longest day on June 20th.

Look to the south and spot the Spring Triangle, made up of the three bright stars Arcturus in Boötes, Spica (a binary) in Virgo and Denebola in Leo. Asteroid Juno (minor planet 3 Juno) is in opposition on the 3rd of March, and you may spot it at its highest point in Leo at around midnight. At magnitude 8.7, you will need a telescope to see it.

Look west at around 19:00 on the 24th of March at 10° above the horizon and you may be lucky enough to spot Mercury at its greatest elongation. It should still be visible until early April.

If galaxy-watching is your thing, try the Pinwheel Galaxy (M101). You'll find it in Ursa Minor and a telescope will reveal the full glory of its face-on spiral arms. The new moon on March 10th would be a good time to look north west just after sunset.



If the skies are clear, our nearest galactic neighbour the Andromeda Galaxy should be visible near Andromeda and Cassiopeia.

April will bring the Lyrid meteors (source comet C/1861 G1 Thatcher). The shower should be visible between 14th - 30th with the peak on 22nd – 23rd. Despite the full moon at this time, you may spot one or two lingering bright dust trails. Following on in May, the Eta Aquariid meteor shower (source comet 1P Halley) is visible between the 19th of April and the 28th of May. The maximum on May 6th occurs just before new moon, so visibility (weather permitting) should be good.

With Thanks

Thank you to all the contributors to this edition of *The Jeety Starn*. Members, please hand over any contributions for consideration in future issues to the editor at any Society lecture or Members' Evening, or email them to the address below.

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