The Jeety Starn

No 11 Jun 2026 ISSN 3029-0848

The Jeety Starn

Welcome to Issue 11 of *The Jeety Starn*, the quarterly newsletter of Stirling Astronomical Society. Included in this issue are articles on asteroid 5771 Somerville, the Orlando Science Center, more news on T Coronae Borealis, astronomer W.J. Luyten, a poem on a pair of well-known flare stars, our usual quota of quotes, and our Happy Observing section, with a note of things to look out for in the sky over the next three months – including a solar eclipse.

Noctilucent Cloud Season

By Sandi Cayless

It's noctilucent cloud season! Noctilucent clouds, also known as night shining clouds, are shimmering, silvery blue cloud-like formations in the upper atmosphere (mesosphere), above the stratosphere at a height of around 80 – 85 km (Gadsden & Parviainen 1995). Noctilucent clouds are most usually seen in the summer months, during June and July at northern latitudes, and the best time to see them are late evening or early morning, as the Sun is below the horizon but still lights up the clouds.

Noctilucent clouds are composed of tiny ice crystals that form around suspended particles of fine dust drifting high in the mesosphere, where the cold in the summer is enough for ice to form. These dust particles are postulated to be the dust left in the atmosphere after volcanic eruptions, or to come from micrometeorites from space that fall to Earth. It is likely that recent increases in sightings are down to the exhaust emissions of rockets sent into space. Confirmation that water ice is the main constituent of noctilucent clouds came in 2001, from the HALOE instrument aboard the Upper Atmosphere Research Satellite (UARS) (Hervig *et al*. 2001).

The Aeronomy of Ice in the Mesosphere (AIM) satellite, launched 25 April 2007, was the first satellite set to study noctilucent clouds and its first observations were published on 25 May 2007 (O'Carroll 2007). Satellite data suggests that these clouds need water vapour, dust and extremely cold temperatures to form.

However, Earth is not the only planet that has noctilucent clouds – similar high-altitude clouds (80 – 100 km) were discovered on Mars in data from the SPICAM Ultraviolet and Infrared Atmospheric Spectrometer during the ESA Mars Express mission in 2006 (ESA 2006). These were considered most likely to be carbon dioxide.

The best way to see noctilucent clouds from Earth at our latitudes is to look into the western sky around an hour or so after the Sun has set, preferably at a location with a flat horizon and a clear wide view of sky. Before sunrise in the early morning, look high to the northeast, to where the Sun will soon rise.

References

ESA (2006) *Rare high-altitude clouds found on Mars*. European Space Agency 28/08/2006. https://www.esa.int/Science_Exploration/Space_Science/Mars_Express/Rare_high-altitude_clouds_found_on_Mars.

Gadsden, M. & Parviainen, P. (1995) *Observing Noctilucent Clouds*. ISBN: 0-9650686-0-9. Electronic Edition published by the International Association of Geomagnetism & Aeronomy 2006 and accessed 01 May, 2026. http://www.iugg.org/IAGA/iaga_pages/pdf/ONC_Sep06.pdf.

Hervig, M., Thompson, R.E., McHugh, M. *et al.* (2001) First Confirmation that Water Ice is the Primary Component of Polar Mesospheric Clouds. *Geophysical Research Letters 28 (6) 971–974.* https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2000GL012104.
O'Carroll, C. (2007) *NASA Satellite Captures First View of 'Night-Shining Clouds'*. NASA, 28 June 2007. http://www.nasa.gov/mission_pages/aim/multimedia/first_view.html.

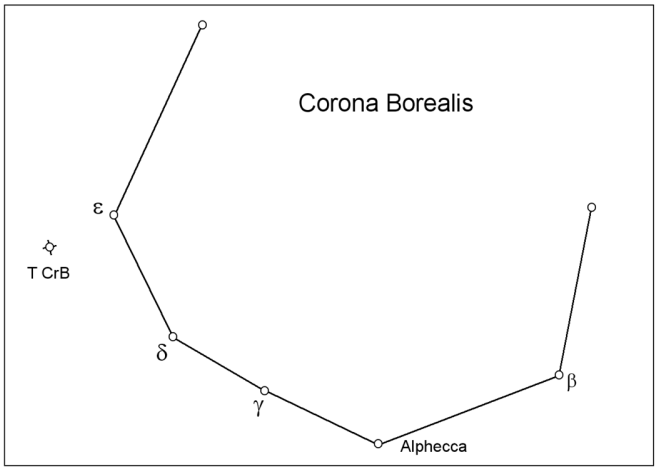
Will T Coronae Borealis finally explode this June?

By Alan Cayless FRS

Over the last year and a half, we have reported on T Coronae Borealis, a *recurrent nova* that brightens significantly approximately every 80 years (Cayless 2024). With the last event having taken place in early 1946, the next brightening has been eagerly anticipated and could happen this summer.

T Coronae Borealis (T CrB) is an example of an *accreting binary system*, consisting of two very different stars orbiting each other. The larger of these is a red giant with a very expanded outer atmosphere. Material from this giant star streams off towards the much smaller and denser companion, a white dwarf. Over the years this material accumulates on the surface of the dwarf star, eventually reaching a critical amount, setting off a sudden burst of nuclear fusion. The star brightens rapidly, before dimming again over the next few days or weeks.

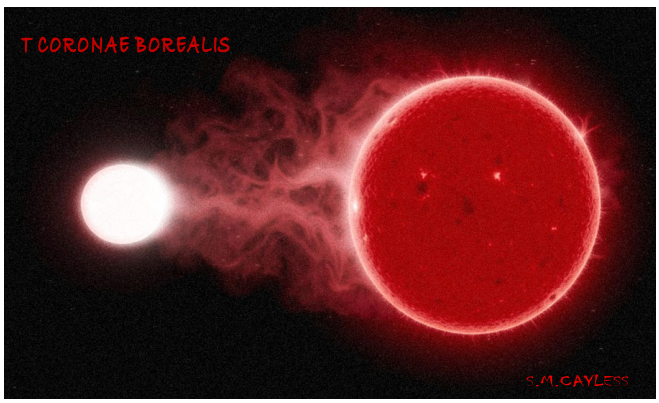
A recent prediction by Jean Schneider of the Paris Observatory suggested that the next eruption of T Coronae Borealis may occur in either November 2025 or June 2026 (Schneider 2024). This prediction was based on the timings of previous outbursts being a multiple of the 228-day orbital period of the T Coronae Borealis system. However, no brightening was seen in November last year (Cayless 2025). Based on the orbital period, the next possible date would be 25 June 2026. Although the nights are short, T Coronae Borealis is currently well placed for observing and will be visible to the south-west during the short hours of darkness around midnight, moving towards the west just before dawn.



To find T Coronae Borealis, look for the constellation Corona Borealis, between Arcturus and Vega. T CrB is located close to epsilon CrB, on the western side of the constellation. Over the next few weeks, try taking a look at Corona Borealis from time to time, to familiarise yourself with the positions of the main stars as they normally appear. When the outburst occurs, you should then be able to recognise T CrB as a new star. You can keep track of the light curve and predictions on the AAVSO and NASA websites, and we will of course also be reporting on our own Stirling Astronomical Society website.

References

Cayless, A. (2024) Nova watch: impending drama in Corona Borealis. *The Jeety Starn 4, p1.* Stirling Astronomical Society. https://www.stirlingastronomicalsociety.org.uk/resources/028-jeety-starn-sep-2024.pdf.
Cayless, A. (2025) T Coronae Borealis remains quiet. *The Jeety Starn 9, p18.* Stirling Astronomical Society. https://www.stirlingastronomicalsociety.org.uk/resources/037-jeety-starn-dec-2025.pdf.
Schneider, J. (2024) When will the Next T CrB Eruption Occur? *Research Notes of the AAS 8 (10)* https://iopscience.iop.org/article/10.3847/2515-5172/ad8bba.

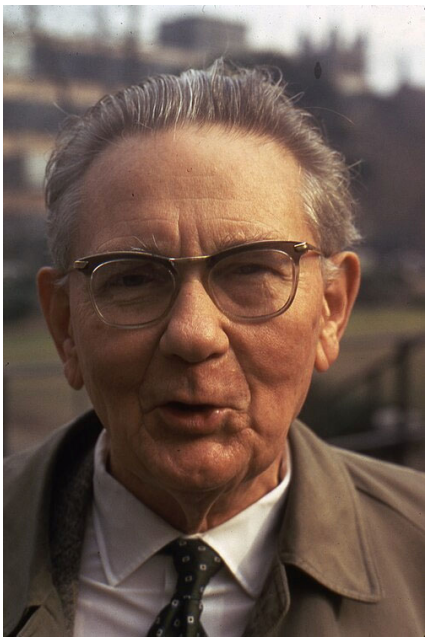


Dutch Astronomers 5

By Sandi Cayless

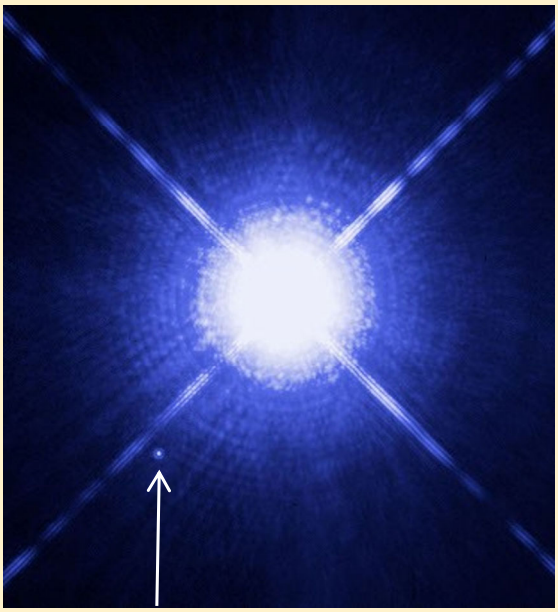
This article, number 5 in the series on Dutch astronomers, deals with the somewhat outspoken Dutch-American astronomer Willem Jacob Luyten, who, *inter alia*, improved the calibration of the Hertzsprung-Russell diagram, increased the understanding of the Milky Way by observations of a huge number of stars, and who gave his name to the interesting red dwarf, Luyten's Star.

Willem Jacob Luyten (1899–1994)



Willem Jacob Luyten was born in 1899 in Semarang in northeast Java, at that time part of the Dutch East Indies, where his father was a French teacher. Luyten's parents were originally from Noord Holland and the family moved back to Amsterdam in 1912 (Pegels 2009). Luyten first began his astronomical observations on Java, carrying them on when he became a student at the University of Amsterdam. When he was 11 years old and still on Java, his uncle awakened him and called him outside to see a "marvellous sight". It was Halley's comet, its head below the horizon but its tail past the zenith. That sight spurred him on to become an astronomer (Luyten 1995). He began by observing variable stars with binoculars and a small refractor, his observations resulting in him becoming a charter member of the American Association of Variable Star Observers (AAVSO) at age 15. He entered Amsterdam University in 1916, to complete his BA in maths and astronomy in 1918. He then moved to Leiden University to work with newly-appointed professor Ejnar Hertzsprung, as Hertzsprung's first doctoral student (Pegels 2009). He spent some summers at the Royal Observatory, Greenwich (ROG), becoming a member of the Royal Astronomical Society, and writing his first paper. During his time at the ROG, he used the 26-inch refractor to work on NGC 6633. He completed his PhD at Leiden in 1921 at the age of 22 (Abt 1968). The latter was based on 13,500 visual variable star observations, some carried out in high school and others with Leiden Observatory's 6-inch refractor (Upgren 1995; Pegels 2009).

Luyten was then offered a Morrison Fellowship at the Lick Observatory, on the summit of Mount Hamilton above San Jose, California, arriving in September 1921 to begin a new research project on stellar motions and white dwarfs (Luyten 1995). There, he built up the way of using stars' proper motions to find their statistical parallaxes; this led to making the Hertzsprung-Russell (H-R) diagram more representative of local stars than previous H-R diagrams based on samples of bright but distant giants or supergiants. He found that giant stars represent only a few percent of stars per unit volume in space. At Lick, he also predicted and found that the sodium D lines of late-type dwarfs and giants vary significantly (Abt 1968).



Binary system of Sirius A and its white dwarf companion, Sirius B: © NASA.

In 1923, Harlow Shapley invited him to join Harvard College Observatory, where, amongst other things including astronomical journalism, he helped redesign and improve the horizontal blink comparator to eliminate a number of optical problems (Luyten 1995). He used the upgraded device to identify and estimate stellar variability and stellar motions as part of the massive study of the proper motions and related characteristics of variable stars for which he is most well-known (Abt 1968). [Proper motion is the angular speed of a star or other celestial object.] The Bruce Proper Motion

Survey, begun in 1927, used plates taken earlier with the 24-inch Bruce Refractor at Arequipa, Peru, and then with plates taken at Bloemfontein, South Africa, where the telescope had been re-sited. Luyten took the first 300 of the Bloemfontein plates and Harvard staff the next 1000. Luyten blinked all these plate pairs, to discover 94,263 proper motions stars, a feat that took 20 years. His final catalogue of these stars was published in 1963.

The Bruce Proper Motion Survey (which covered the Southern Hemisphere) found many late-type dwarf stars, led to better evaluations of star-streaming and the luminosity function (e.g. Luyten 1937), and located more white dwarf stars – in 1923, only 3 were known. With the help of fellow astronomers E. Gaviola, E.F. Carpenter, and G. Haro, Luyten obtained colour estimates for a number of proper motion stars, and by 1960, 350 of the 400 probable white dwarfs known were down to Luyten (Abt 1968). This was an amazing feat for an astronomer with only one working eye – he had lost the other in an accident in his twenties (Pegels 2009) – and caused the German astronomer Walter Baade to refer to him as the Stellar Mortician (Luyten 1995). These meticulous observations and analyses opened the way for, and underpinned, modern large-scale astronomical surveys like Gaia (Oswalt & Martiz 2025; ESA 2026). Included among Luyten's discoveries were thousands of common proper motion binaries; these long-term coexistent pairs of stars, usually thousands of astronomical units apart, had been in general overlooked for many years (Oswalt & Martiz 2025).

Luyten also extended the search for fainter stars, and included the Northern Hemisphere, by initiating the massive National Geographic / Palomar Observatory study, and realising that the blink comparator method was slow and outdated, approached the Control Data Corporation with plans to produce a rapid scanning microdensitometer (Upgren 1995). This CDC machine (principal designers James Newcomb and Anton LaBonte) was at the time the fastest and most accurate automatic device for measuring and blinking stellar images, making it possible to work out the proper motion of hundreds of thousands of stars in a relatively short time.

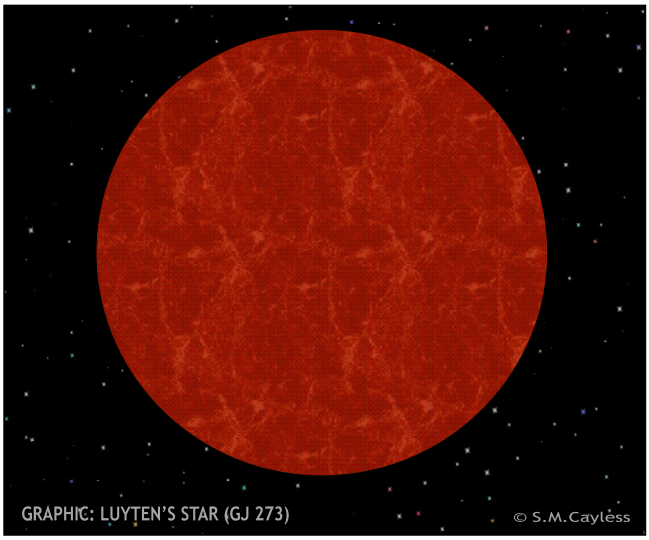
Luyten lived in Bloemfontein between 1928 and1930, and there he met and married Willemina H. Miedema (Pegels 2009). During his spell there, he took time out to delve into other astronomical matters, such as the Grootfontein Meteorite (Luyten, 1929a, 1929b, 1930). In 1931, after returning to the USA, Luyten moved to the University of Minnesota, where he became a professor in 1937 (Abt 1968). He taught introductory and advanced astronomy as well as conducting his own research, which encompassed other topics, such as apsidal motion in spectroscopic binaries (Abt 1968), faint blue stars and low mass faint red dwarfs; he used the latter data to determine the stellar luminosity function, i.e. an indicator of the frequency distribution of stars as a function of luminosity and hence mass (Luyten 1995). Later, some of his faint blue stars were found to be quasars, for which he adjusted his statistics. With scope for direct observation in Minneapolis limited, as there was no suitable telescope, Luyten fostered relationships with various observatories, including Hale, Mount Wilson, and those in Argentina, Mexico and Arizona, to obtain data.

Red dwarf Proxima Centauri, 4.25 light-years away in Centaurus: © ESA/Hubble & NASA.

He remained at Minnesota until his retirement in 1967 (Upgren 1995). During his career he published over 500 research papers and books, numerous popular articles, and popular books, including *The Pageant of the Stars* (Luyten, 1929c). One of the bodies named for him is Luyten's Star (GJ 273); Luyten, in collaboration with Edwin G. Ebbighausen, first resolved its high proper motion in 1935 (Luyten & Ebbighausen 1935). Luyten's Star is a red dwarf in the constellation Canis Minor, located 12.35 light-years from the Sun and with a visual magnitude of 9.9. It is now known to have two confirmed and two candidate planets (Pozuelos *et al*. 2020). Luyten's key achievement was the publication of a series of catalogues of high proper motion stars. He catalogued 17,000 of these stars alone in the Luyten

Two-Tenths Arcsecond Catalog (LTT), actually a pair of catalogues, which were updated as the new, or NLTT Catalogue and its supplement (Luyten 1979, 1980; Luyten & Hughes 1980).

In 1948, while compiling his catalogue of high proper motion stars, Luyten discovered the binary star system Gliese 65 (cataloguing it as Luyten 726-8), noting its very high proper motion of 3.37 arc seconds annually (Luyten 1949). Gliese 65 is in the constellation Cetus, and at 8.8 light-years from Earth, is the seventh closest of our stellar neighbours. The two stars, of almost equal brightness, orbit one another every 26.5 years. Both components are flare stars, with the variable star designations BL Ceti and UV Ceti. Each star has about 10 percent of the mass of the Sun and a radius about 14 percent that of the Sun (Ornes 2023). BL Ceti is a red dwarf of spectral type M5.5V, while UV Ceti, a red dwarf of spectral type M6V, which has the more violent temper, was the first known example of this category. Both stars are listed as spectral standards for their respective classes (Kirkpatrick *et al*. 1991).



Towards the end of his academic career, Luyten received honours for his lifetime of work. He was awarded the James Craig Watson Medal in 1964, and the Bruce Medal in 1968. He was also elected to the National Academy of Sciences in 1970, and in the same year, he was awarded an honorary doctorate by St. Andrews University (Pegels 2009). Retirement did not slow Luyten down, and he remained active, organising and heading the first conference on proper motions in April 1970, the proceedings of which were published by the International Astronomical Union. In 1987, the International Astronomical Union Colloquium was dedicated to Luyten. This conference dealt with wide components in double and multiple stars, and during it, Luyten, then 88 years old, gave a review of his lifetime of research. Asteroid 1964 Luyten, discovered on the 24th August 1960 at Palomar by C. J. van Houten, I. van Houten-Groeneveld and T. Gehrels, was named for him (IAU 2026). Luyten passed away in Minneapolis at the age of 95 on November 21, 1994, and was survived by his wife, Willemina, his three children Mona Luyten Coetzee, Anne Luyten Dieperink and James R. Luyten, and several grandchildren (Luyten 1995).

References

Abt, H.A. (1968) Award of the Bruce Gold Medal to Professor Willem J. Luyten. *Pub. Astro. Soc. of the Pacific 80 (474) 247–250.* https://iopscience.iop.org/article/10.1086/128625.

ESA (2026) *Gaia: ESA's billion star surveyor*. European Space Agency, https://www.esa.int/Science_Exploration/Space_Science/Gaia. Accessed 02 Mar 2026.

IAU (2026) The International Astronomical Union Minor Planet Center (1964) Luyten = 1929 TU = 1933 UA1 = 2007 P-L. https://minorplanetcenter.net/db_search/show_object?object_id=1964.

Kirkpatrick, J.D., Henry, T.J. and McCarthy, D.W. Jr. (1991) A Standard Stellar Spectral Sequence in the Red/Near-Infrared: Classes K5 to M9. *Astrophysical Journal Supplement 77, 417-440.* https://ui.adsabs.harvard.edu/abs/1991ApJS...77..417K/abstract.

Luyten, J.R. (1995) Obituary: Willem Jacob Luyten, 1899-1994. *Bull. American Astronomical Society 27(4) 1480-1481.* https://adsabs.harvard.edu/full/1995BAAS...27.1480L.

Luyten, W.J. (1922a) The mean parallax of early-type stars of determined proper motion and apparent magnitude. *Pub. Astro. Soc. of the Pacific 34 (199) 156-160.* https://iopscience.iop.org/article/10.1086/123176/pdf.

Luyten, W.J. (1922b) Note on some faint early-type stars with large proper motions. *Pub. Astro. Soc. of the Pacific 34 (197) 54-55.* https://iopscience.iop.org/article/10.1086/123146/pdf.

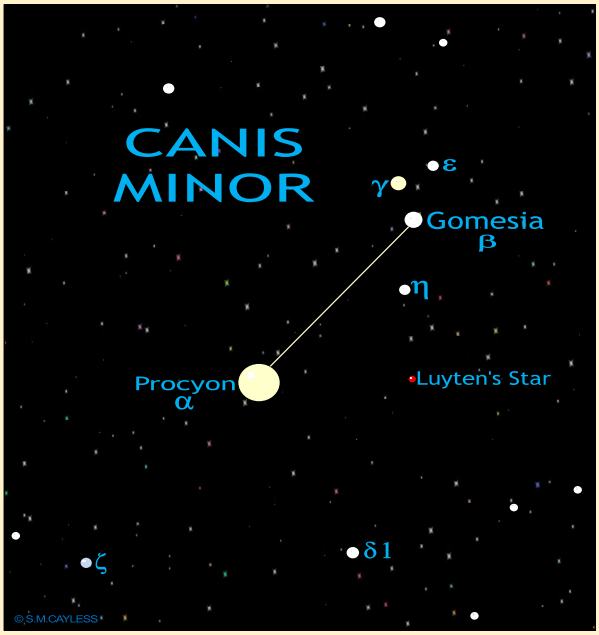
Luyten, W.J. (1922c) Additional note on faint early-type stars with large proper motions. *Pub. Astro. Soc. of the Pacific 34 (198) 132-132.* https://iopscience.iop.org/article/10.1086/123168/pdf.

Luyten, W.J. (1922d) Third note on faint early-type stars with large proper motions. *Pub. Astro. Soc. of the Pacific 34 (202) 356-357.* https://iopscience.iop.org/article/10.1086/123244/pdf.

Luyten, W. J. (1929a) The Grootfontein Meteorite. *Harvard College Observatory Bulletin No. 868, pp.1-1.* https://adsabs.harvard.edu/full/1929BHarO.868....1L.
Luyten, W. J. (1929b) The Grootfontein Meteorite. *South African Journal of Science 26, 19-20.* https://journals.co.za/toc/sajsci/26/12.
Luyten, W.J. (1929c) *The Pageant of the Stars.* Doubleday, Garden City, New York.
Luyten, W. J. (1930) The Grootfontein Meteor. *Popular Astronomy 38, 13-17.* https://babel.hathitrust.org/cgi/pt?id=mdp.39015013754299&seq=39.
Luyten, W.J., Ebbighausen, E.G. (1935) A Faint Star of Large Proper Motion. *Harvard College Observatory Bulletin 900, 1-3.* https://articles.adsabs.harvard.edu/cgi-bin/nph-iarticle_query?1935BHarO.900....1L&defaultprint=YES&filetype=.pdf.
Luyten, W.J. (1937) A preliminary discussion of the stream motions of 85,000 faint proper- motion stars. *Annals of the Astronomical Observatory of Harvard College 105 (20) 397-402.* https://adsabs.harvard.edu/full/1937AnHar.105..397L.
Luyten, W.J. (1949) New stars with proper motions exceeding 0.5" annually. *The Astronomical Journal 55 (1181), 15-15.* https://articles.adsabs.harvard.edu/pdf/1949AJ.....55...15L.
Luyten, W. J. (1979, 1980) *New Luyten Catalogue of Stars with Proper Motions Larger than Two Tenths of an Arcsecond.* University of Minnesota, Minneapolis. https://heasarc.gsfc.nasa.gov/W3Browse/star-catalog/nltt.html.
Luyten, W.J. and Hughes, H.S. (1980) *Proper Motion Survey with the Forty-Eight Inch Schmidt Telescope. LV. First Supplement to the NLTT Catalogue.* University of Minnesota, Minneapolis, Vol. 55, p. 1 (1980). https://ui.adsabs.harvard.edu/abs/1980PMMin..55....1L/abstract.
Ornes, S. (2023) Explore the 10 nearest stars. *Astronomy Magazine, 51 (6) June 2, 2023.* https://www.astronomy.com/science/explore-the-10-nearest-stars/.
Oswalt, T., & Martiz, M.L. (2025). Revisiting an Often-Overlooked Part of Willem J. Luyten's Legacy: Common Proper Motion Binaries. *Bulletin of the AAS, 57(2).* https://doi.org/10.3847/25c2cfeb.c924491d.
Pegels, C. (2009) *Willem Jacob Luyten [1899-1994] Astronomer.* New Netherlands Institute. https://www.newnetherlandinstitute.org/history-and-heritage/dutch_americans/willem-jacob-luyten. Accessed 26 Feb 2026.
Pozuelos, F.J., Suárez, J.C., de Elía, G.C., Berdiñas, Z.M. et al. (2020) GJ 273: On the formation, dynamical evolution, and habitability of a planetary system hosted by an M dwarf at 3.75 parsec. *Astronomy & Astrophysics. 641: A23.* https://www.aanda.org/articles/aa/pdf/2020/09/aa38047-20.pdf.
Upgren, A.R. (1995) Willem Jacob Luyten (1899-1994). *Pub. Astro. Soc. of the Pacific 107 (713) 603-605.* https://iopscience.iop.org/article/10.1086/133599/pdf

Image References

Willem Luyten at the International Astronomical Union (IAU) meeting at Sydney, Australia, August 21, 1973. Scanned from the John Irwin Slide Collection No. 397-19. Credit: AIP Emilio Segre Visual Archives, John Irwin Slide Collection. © American Institute of Physics (AIP). https://repository.aip.org/willem-luyten-international-astronomical-union-iau-meeting-1. Accessed 26 Feb 2026.
Sirius A and Sirius B: © NASA. Hubble Space Telescope image of Sirius A (overexposed) with its faint, white dwarf companion, Sirius B. https://science.nasa.gov/asset/hubble/the-dog-star-sirius-and-its-tiny-companion/.
Red dwarf Proxima Centauri: © ESA/Hubble & NASA. Hubble Space Telescope image of the red dwarf Proxima Centauri. https://science.nasa.gov/universe/stars/types/.
Luyten's Star: illustration © Sandi Cayless.
Constellation Canis Minor showing position of Luyten's Star: © Sandi Cayless.



Constellation Canis Minor, showing position of Luyten's Star.

A Quote or Two...

Newton, Sir Isaac (1642-1727)
I know not how I seem to the world, but to myself, I am but a small child wandering upon the vast shores on knowledge, every now and then finding a small bright pebble to content myself while the vast ocean of undiscovered truth lay before me.

I can calculate the motion of heavenly bodies, but not the madness of people.

What we know is a drop, what we don't know is an ocean.

Tact is the art of making a point without making an enemy.

If I had stayed for other people to make my tools and things for me, I had never made anything.

If I have seen further than others, it is by standing on the shoulders of giants.

Peltier, Leslie C. (1900-1980)
I have watched a dozen comets, hitherto unknown, slowly creep across the sky as each one signed its sweeping flourish in the guest book of the sun.

Plato (427-347 BCE)
For everyone... must see that astronomy compels the soul to look upwards and leads us from this world to another.

Ptolemy
I know that I am mortal and the creature of a day; but when I seek out the massed wheeling circles of the stars, my feet no longer touch the earth...

Pythagoras (582-497 BCE)
Above the cloud with its shadow is the star with its light.

There is geometry in the humming of the strings, there is music in the spacing of the spheres.

Ride, Sally (1951- 2012)
When you're getting ready to launch into space, you're sitting on a big explosion waiting to happen.

Rohrabacher, Dana (1947-)
The Space Shuttle is the most effective device known to man for destroying dollar bills.

Roszak, Theodore (1933-2011)
Nature composes some of her loveliest poems for the microscope and the telescope. (Where the Wasteland Ends, 1972).

Russell, Mark (1932-2023)
The scientific theory I like best is that the rings of Saturn are composed entirely of lost airline luggage.

Sagan, Carl (1934-1996)
For me, it is far better to grasp the Universe as it really is than to persist in delusion, however satisfying and reassuring.

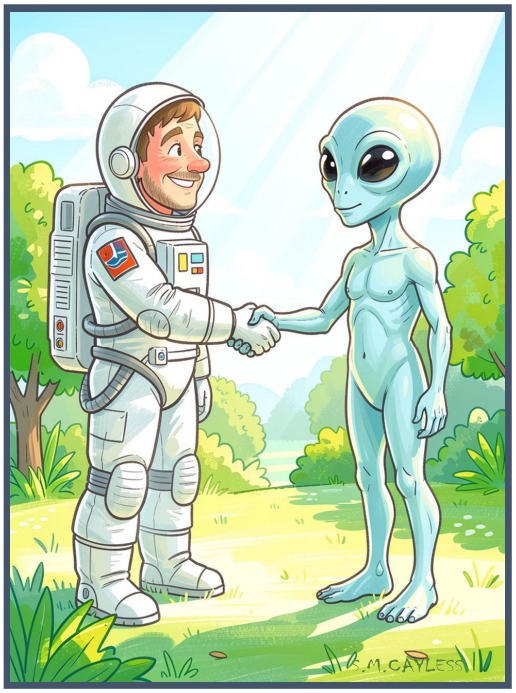
In order to make an apple pie from scratch, you must first create the universe.

The nitrogen in our DNA, the calcium in our teeth, the iron in our blood, the carbon in our apple pies were made in the interiors of collapsing stars. We are made of starstuff.

Somewhere, something incredible is waiting to be known.

Who are we? We find that we live on an insignificant planet of a humdrum star lost in a galaxy tucked away in some forgotten corner of a universe in which there are far more galaxies than people.

Sagan, Françoise (1935-2004)
When man, Apollo man, rockets into space, it isn't in order to find his brother, I'm quite sure of that. It's to confirm that he hasn't any brothers.



Orlando Science Center

By Cairenn Farland

The Orlando Science Center (OSC) is an educational science museum in Orlando, Florida, USA. Founded in 1955 it was known initially as the John Young Museum and Planetarium (Florida Memory 2026). It is funded by the Arts and Cultural Affairs Program of the City of Orlando and the Division of Arts and Culture and the National Endowment for the Arts of the State of Florida. It caters for all ages, from pre-school to youth to adult and has many exhibits and hands-on programs over four levels, including space-related shows (OSC 2026). The exhibit halls have many interactive learning options like exploring the natural sciences and working with simulation technology. These are added to all the time with new shows and exhibits (see: www.osc.org/).

Level One

The first level has three main display areas: Life, Food Heroes, and The Dome. ***Life*** shows nature and conservation in three habitats, Rainforest, Ocean and Swamp. In simulated ecosystems with real animals, visitors learn how humans are part of nature and what they can do to conserve resources and protect the planet. Rainforest is temperature and humidity controlled, with a waterfall splashing into a pool of fish, free-flying birds like tanagers, honeycreepers, and blackbirds, and trees with sloths and tamarins. The Ocean gallery is a 360° view area with coloured reef fish, sharks, corals, and hands-on wet areas to see sea-stars and crabs. The Swamp has cypress trees, turtles, alligators, and fish, and squirrels run overhead through clear tunnels. ***Food Heroes*** looks at how Earth's food system works and shows how to make it sustainable and healthier. It links to the 4Roots Café and has exhibits including pollination, a living wall for vertical farming, and stories of hydroponic gardens and plant-growing for medicine. The third area *was* the *Dr. Phillips CineDome*, where a 15/70 giant projector screen showed classic science films (GSCA 2025). ***The Dome*** is being renovated as a state-of-the-art digital experience and will feature an 8K full-dome digital projection system with immersive audio for planetarium and laser light shows.

Level Two

The first of four areas on the second level is ***Mission: Astronaut***. In this exciting 6-zone area, visitors can experience what it's like to live in, work in, and explore space. It uses real NASA footage and it has challenges to let visitors train like an astronaut, carry out science experiments and get a feel for the future of space exploration. It links to the STEM (Science, Technology, Engineering, and Maths) principles in physics, biology and engineering. In the *Welcome to Training* start, fictional astronauts explain the skills you need to explore space as a team. The *Prepare for Space* simulation instructs in the basics of aerospace engineering, shows how to pack a capsule, get into orbit, and dock at a space station. *Living in Space* lets guests feel how difficult simple tasks like cooking, sleeping, and staying clean can be in microgravity. Then, *Science in Space* explains how research aboard the International Space Station, such as monitoring health and growing plants, is useful to understand Earth, and in the future, how to feed astronauts on Mars and other places. In *Space Operations*, visitors take on the role of Mission Specialists, using skills such as working a robotic arm, building a spacesuit, and learning to maintain and repair spacecraft in space. Finally, *The Future of Space Exploration* lets visitors design habitats for future astronauts to live in, on other planets.

Young visitors (ages 0 to 7) have things to do in the ***KidsTown*** zone, where activities include exploring their surroundings (Toddler Town), trying out simple machines (Orange Grove), physical activity (Isaacs Family Climb Time) and building a tower out of huge blocks (Explore It). Little guests can interact in acting, music, and movement in Harriett's Theatre, and join in creative arts like painting in the Studio, and young scientists can use water, props and scientific principles to look at how water moves in the Drip Drop Splash area.

The ***Kinetic Zone*** is for teaching the basics of forces, and the principles of physics and engineering, with fun things like launching air rockets, investigating electrical circuits, lifting yourself off the ground with pulleys, trying out the Balance Challenge on an 18-foot zip line, or the Coaster Challenge, where you use pipes to build a model roller coaster.

The ***Digital Adventure* Theater** is a giant-screen auditorium that has exciting live shows (e.g. Science Live Shows such as the High Voltage show, and the Exploring Space show) and immersive 2D and 3D films (NB: the 3D glasses provided must be left in the labelled bin at the end of the show). The theater has state-of-the-art 4K laser projection and 7.1 surround-sound. It is being renovated at present, and *should* re-open in Summer 2026 (OSC 2026).

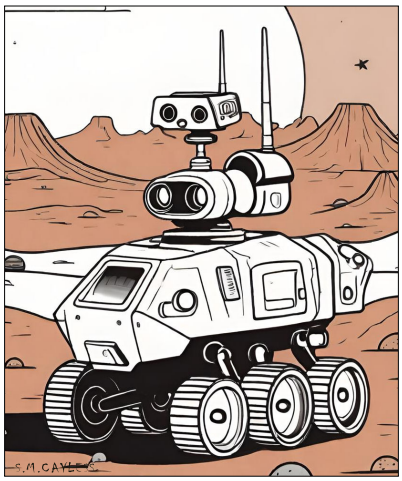
Level Three

The third level holds ***The Hive: A Makerspace*** (ages 8+), a creative space where visitors learn together to try out skills and share their ideas. (Under 12s have to be with an adult). There is also ***Fusion: A STEAM Gallery***, where **A**rt is fused with **STEM** principles (i.e. Science, Technology, Engineering, Arts and Maths). Permanent exhibitions include an interactive, visual *theremin* and a motorised colour projection model, and travelling exhibitions are brought in that highlight local artists and include themes such as space exploration.

Level Four

The top level of the OSC has two main areas: *DinoDigs* and *Our Planet, Our Solar System*. In ***DinoDigs***, there are huge replica skeletons of dinosaurs and prehistoric sea creatures as well as fossils of ancient reptiles and mammals, some that were dug up in Florida. There is a huge block set up showing the prehistoric time line, and a wall display of a prehistoric ridge landscape, and guests can practice being palaeontologists by digging in the Jurassic Ridge dig pit.

Our Planet, Our Solar System has quite a few displays to show how the atmosphere, biosphere, geosphere and hydrosphere of our planet are linked, and how a tiny change in one of them can badly affect others. You can experience an earthquake in a simulator and feel what it is like inside of a cloud, or you can use a set-up and tools like a weather-presenter on TV to present a weather forecast. Earth and space science is displayed and explained using projectors, on a huge suspended sphere, to show Earth's relationship with the other planets of the Solar System. The *Solar System Exploration Timeline Wall* is a visual board that shows the main achievements in exploring space. It starts with Sputnik, launched in 1957, and goes through the Apollo missions, the Mars rovers and all the way to Artemis, and the return of humans to the Moon. The *Early Days of Space Travel* exhibit has displays of bits and pieces from early (50s, 60s, 70s) space exploration and travel. At the *Rocket Builder* stand, visitors can build a virtual rocket on the computer screen and then blast off; they choose the parts like engines, fuel tanks and payloads, to learn how gravity, wind-resistance and orbital dynamics have effects on designs. The *Lunar Lander* lets a user practice a landing on the moon by balancing gravity, thrust, and fuel use on a screen. The *Explore Mars* bit has a similar sort of interactive console with buttons to let operators pilot the Mars Ingenuity helicopter, as well as plot a path for the Perseverance rover.



On level four, you can also find Finfrock Terrace. This is a semi-circular balcony outside that gives a panoramic view of Downtown Orlando; it has lines of lights strung overhead, a small stage space for musicians and tubs of greenery, and can be booked and set up for special events.

The Science Center facilities do have some garage parking (not free) with accessible spaces and electric car charge points. It is open in regular museum hours, but it's not very big. Visitors enter the Center by the Love Bridge on level 2 of the parking garage. There are bicycle racks round the museum, and baby buggies and wheelchairs can be borrowed (you need a valid photo ID). There are elevators, stairs, and restrooms all over, and cafés on levels 1 and 2.

References

Florida Memory (2026) *John Young Museum and Planetarium at 777 E. Princeton St. in Orlando, Florida*. State Library and Archives of Florida, https://www.floridamemory.com/items/show/94379.
GSCA (2025) *The Final Thread: A Full-Circle Moment at the Orlando Science Center*. Giant Screen Cinema Assoc. https://www.giantscreencinema.com/new-orlando-science-center-cinedome-project-breaking-ground-in-2025/.
OSC (2026) Orlando Science Center. https://www.osc.org/.

Image Credits

Red Dwarf Dance

By Arryll Idrennis

In quiet depths of cosmic night,
Two embers glow in ruby light;
Bound by gravitation's thread,
To dance in starlight's icy bed.

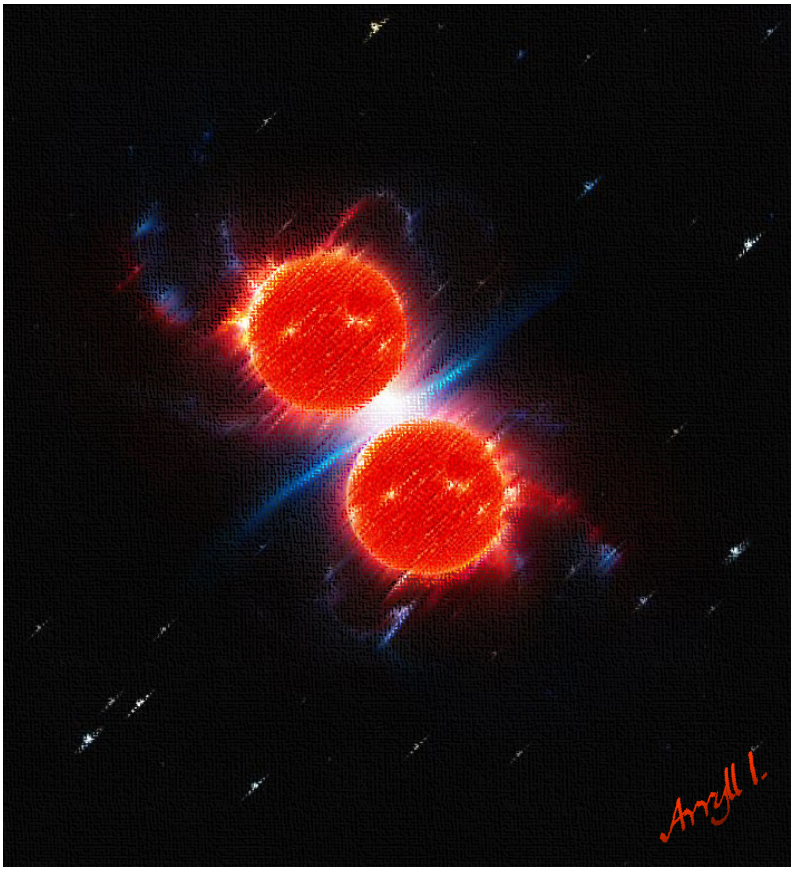
In ancient Cetus, dim, they spin;
And pulse and glow, to fade again –
A duet where the darkness gleams
With silent stars and ancient dreams.

But fierce within coronal glow,
As plasma burns, electrons flow…
In fast magnetic streams, aglow
With ions, beams, that racing go –

A flash, a flare, a burst of light,
An energising sun-sparked flight,
As spectrum-wide, a flare burns bright –
Shoots streamers to the edge of sight.

As energies less potent grow
To slowly cool the blazing flow,
The red dwarf sinks to calm again,
Its ruby fire once more serene.

They spin in evening's darkest vaults –
Twin dwarfs in endless starry waltz;
Gliese six-five – a name, a spark,
A flash of beauty in the dark.



The two component stars of Gliese 65 are red dwarfs with the variable star designations BL Ceti and UV Ceti, and are both flare stars.

A Note on Flare Stars

By Sandi Cayless

UV Ceti, first seen to flare in 1948, is the most renowned *flare star*, and nowadays similar flare stars are classified as UV Ceti type variables in catalogues of variable stars, e.g. the *General Catalogue of Variable Stars* (GCVS). Flare stars are so-called because they exhibit random, spectacular brightness surges that last a few minutes. The flares are thought to be similar to solar flares and down to the magnetic energy in the stellar atmosphere (Aschwanden *et al*. 2008). The brightness rise of a flare spans the spectrum from X-rays to radio waves. A. van Maanen first reported flare activity in late-type stars in 1945, for WX Ursae Majoris and YZ Canis Minoris (Joy 1954). Most flare stars are dim red dwarfs.

Flare stars in our own stellar backyard include Proxima Centauri (in Centaurus, at 4.24 LY), Barnard's Star (in Ophiuchus, at 5.96 LY), Wolf 359 (aka Gliese 406/ CN Leo, in Leo, at 7.86 LY), EV Lacertae (in Lacerta, at 16.5 LY) and TVLM513-46546 (in Boötes, at 35.01 LY).

References

Aschwanden, M.J., Stern, R.A., Gudel, M. (2008) Scaling Laws of Solar and Stellar Flares. *Astrophys. J. 672 (1):* 659-673. arXiv:0710.2563. Bibcode:2008ApJ...672..659A. doi:10.1086/523926.
Joy, A.H. (1954) Variable Stars of Low Luminosity. *Pub. Astronomical Soc. Pacific. 66 (388):* 5. Bibcode:1954PASP...66....5J. doi:10.1086/126639.

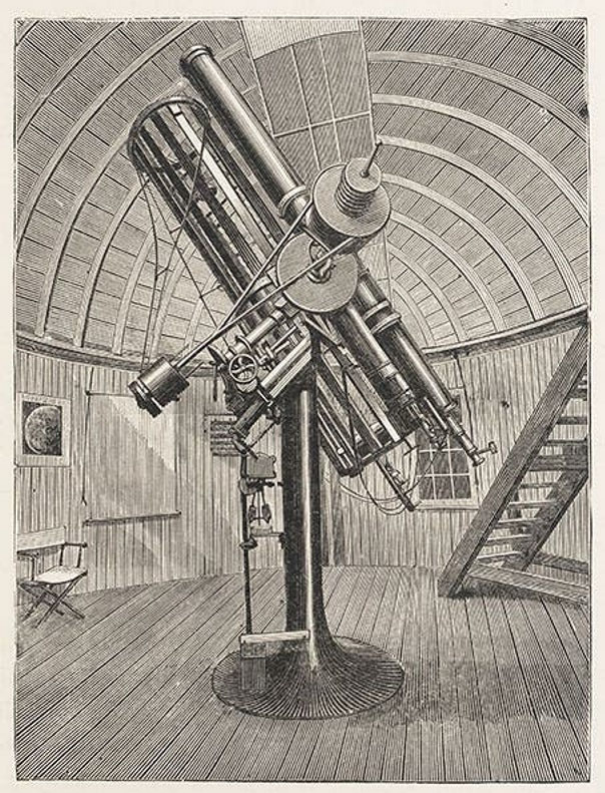
The Henry Draper Catalogue

By Alan Cayless FRAS

On star charts and in planetarium programs such as Stellarium, you may have noticed stars designated by reference numbers beginning with the letters "HD". These are stars in the Henry Draper Catalogue, an extensive catalogue of almost 360,000 stars compiled between 1911 and 1949.

Henry Draper (1837–1882) was one of the first people to apply the newly-developed technique of photography to astronomical investigations, making him one of the earliest astrophotographers. In 1880 and 1882 he took two of the first known photographs of the Orion Nebula. Draper was also the first astronomer to use photography to record the spectra of stars, allowing detailed and precise measurements of their spectral lines.

Henry and his wife, Anna Palmer Draper (1839–1914), set up an observatory in Hastings-on-Hudson, near New York. They had two telescopes, a 28-inch reflector, and a 12-inch Clark refractor. Using these, Henry and Anna recorded the spectrum of Vega in 1872.



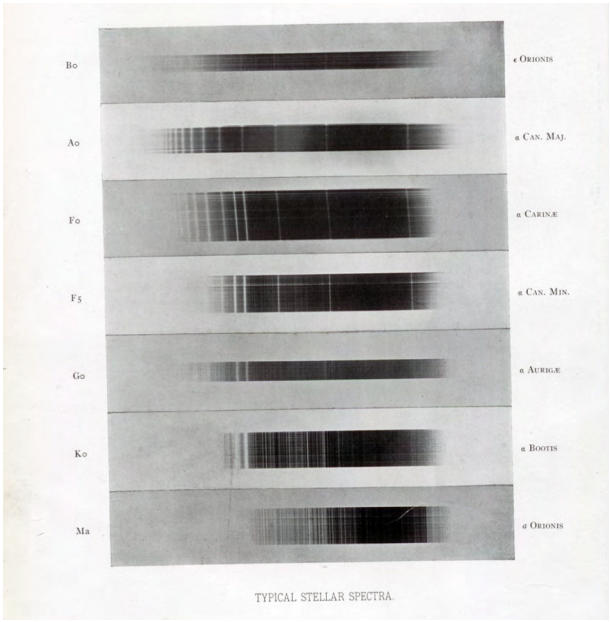
Henry and Anna's telescopes at their Hastings-on-Hudson observatory. Image credit: Washington Astronomical Observations, 1876 (Linda Hall Library)

Draper went on to photograph the spectra of more than a hundred other stars but in 1882, and shortly after taking his second Orion photograph, Henry sadly died at the age of 45. Determined that the work should continue, Anna enlisted the help of Harvard astronomer Edward Pickering (1846–1919), and using a fortune inherited from her father she established the Henry Draper Memorial Fund, with the aim of supporting a project to classify stars according to their spectra. The telescopes were transferred to the Harvard College Observatory in Cambridge, Massachusetts, where plates taken by Pickering's spectroscopy team were analysed by the Harvard computers, most notably Williamina Fleming (1857–1911), who led the classification project.

Fleming originally classified the stars according to the strengths of certain emission lines in their spectra, using the letters A to D for those with the most dominant Hydrogen lines, and letters E to Q for stars with less prominent Hydrogen lines and with lines of other elements. Over the next few years this scheme was modified, firstly by astronomer Antonia Maury (1866–1952) and later by Annie Jump Cannon (1863–1941), as the relationship between spectral type and surface temperature became clearer, a relationship later confirmed by Cecilia Payne-Gaposchkin (1900–1979) (Payne 1925).

While originally determined by the types and strengths of emission lines, the spectral type is essentially a measure of a star's surface temperature. The temperature affects the overall shape of the black-body contribution to the spectrum, in addition to the strengths of the spectral lines. This overall shape can be quantified and is typically referred to by the measurement B-V, which is the difference in a star's brightness when imaged through blue (B) and green (V) filters. The relationship between spectral class and luminosity forms the basis of the *Hertzsprung-Russell diagram*.

When arranged in order of temperature, Fleming's original alphabetical classes were reorganised into the familiar order O-B-A-F-G-K-M. Within the HD catalogue, each of these spectral types is further divided into 10 smaller groups indicated by the digits 0 to 9, with 0 being the hottest and 9 the coolest within each category. Our own Sun, for instance is a type G2 star, placing it towards the warmer end of the G spectral class. This classification scheme is known as the *Harvard spectral classification scheme*, and is still in use today.



A selection of stellar spectra with their Harvard classifications. Original plate from the 1918 Henry Draper Catalogue.

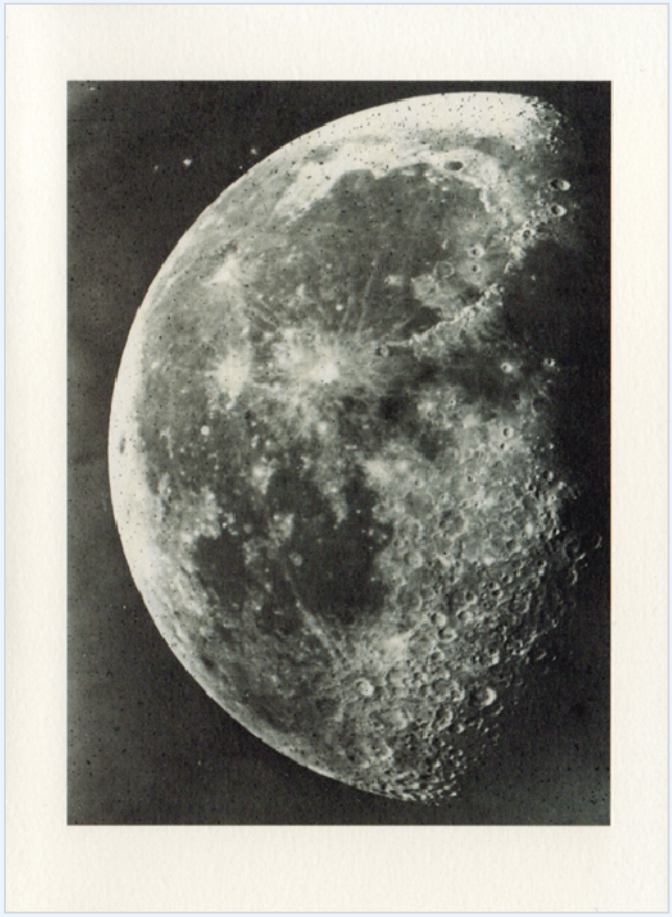
After analysing thousands of plates, the first volume of the Henry Draper Catalogue was published in 1918 (Cannon & Pickering 1918), with eight further volumes published over the next few years. By 1924 over 225 thousand stars had been classified and catalogued. Extensions to the catalogue have been published over the years, and the Henry Draper Catalogue currently contains listings of almost 360 thousand stars.

Many stars have multiple designations, indicating that they appear in several different catalogues. For example, the bright star Regulus in Leo is identified as HD 87901 and also as HIP 49669, which is its designation in the Hipparcos catalogue. Regulus also appears in the SAO (Smithsonian Astrophysical Observatory) star catalogue as SAO 98967. Each of these catalogues has a specific purpose, detailing different characteristics of the stars listed such as precise measurements of position, parallax, and proper motion. These later catalogues also list the spectral type, but the HD catalogue was the first large-scale catalogue to do so.

References

Cannon, A. J. & Pickering, E. C. (1918) The Henry Draper catalogue oh, 1h, 2h, and 3h. *Annals of Harvard College Observatory, vol. 91, pp.1-290*. Bibcode: 1918AnHar..91....1C. http://ui.adsabs.harvard.edu/abs/1918AnHar..91....1C.

Payne, C. H. (1925). Stellar Atmospheres; a Contribution to the Observational Study of High Temperature in the Reversing Layers of Stars (Ph.D.). Radcliffe College. Bibcode: 1925PhDT.....1P. https://ui.adsabs.harvard.edu/abs/1925PhDT.....6P.



The pioneering *Moon Over Hastings* photograph © Hastings Historical Society.

The original was taken by Henry Draper in his observatory in Hastings-on-Hudson, near New York, on September 3, 1863 and released as a Draper Observatory notecard.

The image comes from the Hastings Historical Society (https://hastingshistoricalsociety.org/draper-observatory-cottage/), which is located at the original site of the Draper Observatory.

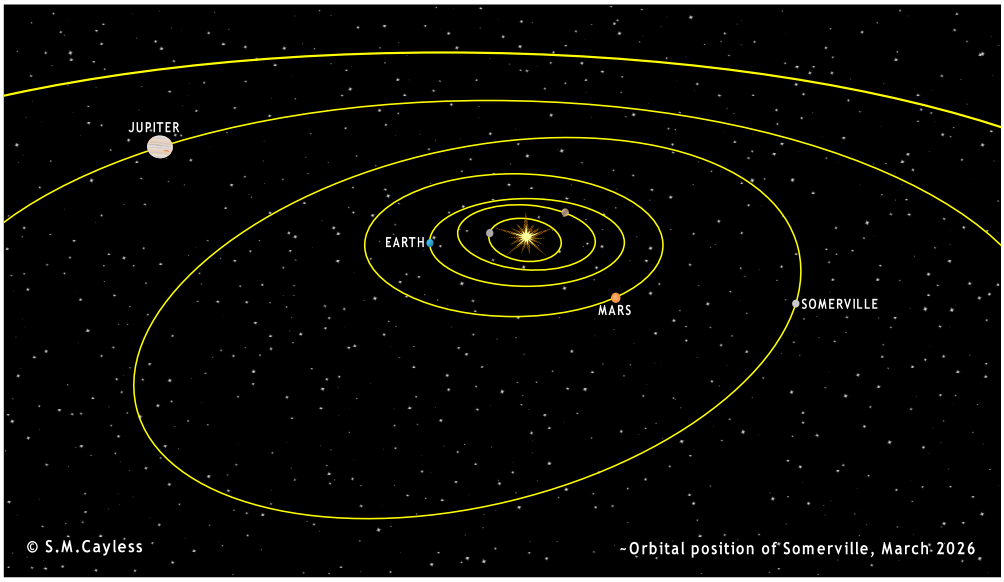
The Historical Society donated the original glass negative of the above view to the Smithsonian Institution, Washington D.C., in 1983.

Interesting Asteroids (8)

By Sandi Cayless

This article deals with asteroid **5771 Somerville**, an object from the outer part of the main asteroid belt. It was named for Mary Somerville, the Scottish polymath whose face can be seen on the front of every current Royal Bank of Scotland ten pound note. Asteroid 5771 is one of the Lixiaohua family of outer-belt asteroids, which share physical properties (De Prá *et al*. 2020). With over 700 known members, all deemed C-type or X-type, these are carbonaceous and named for asteroid 3556 Lixiaohua. Somerville is listed as a likely C-type, based on lightcurve data (Warner 2021).

Somerville is provisionally designated 1987 ST1 (IAU 2026) and is 26.3 km in diameter (JPL 2025). Its discovery is credited to U.S. astronomer Edward Bowell (1943-2023) of the Anderson Mesa Station of the Lowell Observatory in Flagstaff, Arizona, on 21st September 1987 (IAU 2026, JPL 2025). He was the chief investigator on LONEOS (Lowell Observatory Near-Earth-Object Search), and has an asteroid named for him (2246 Bowell). Somerville was first designated as 1982 YY1, when it was initially spotted at Purple Mountain Observatory (Zijinshan Astronomical Observatory), east of Nanjing, China, in December 1982. In the discovery and tracking of asteroids and comets, the observation *arc length* is the length of time between the body's earliest and latest observations and is used for working out the body's track and thus its orbit (Grokipedia 2026).



Given in days or years, *arc length* usually begins with its official discovery observation at Flagstaff (IAU 2026). It greatly influences the accuracy of the orbital estimate, reduces uncertainty, and allows the body to be found again by observation.

Asteroid 5771 Somerville	
Argument of Perihelion (°)	103.48439
Ascending Node (°)	287.85640
Orbital Inclination (°)	8.26600
Orbital Eccentricity	0.2161203
Perihelion Distance (AU)	2.4622737
ΔV w.r.t. Earth (km/sec)	10.2
Semi-Major Axis (AU)	3.1411371
Mean Anomaly (°)	304.47774
Mean Daily Motion (°/day)	0.17704090
Aphelion Distance (AU)	3.820
Period (years)	5.57
Absolute Magnitude	12.45
Diameter (km)	28.306
Phase Slope	0.15
	Data: IAU/JPL

Asteroid 5771 Somerville is not classed as a Near Earth Object nor a Potentially Hazardous Object, and orbits the sun every 2,030 days (5.56 years), its closest 2.46 AU and its furthest 3.82 AU (Mou & Webster 2021). Asteroids this far out are usually amongst the oldest rocks in the Solar System. The body rotates on its axis every 9.20 hours; this was calculated using data obtained from photometric observations by U.S. astronomer Brian Warner at Palmer Divide Observatory, Colorado, to produce a rotational lightcurve for Somerville (Warner 2012). Analyses also gave a brightness amplitude of 0.80 magnitude. At 26.3 km diameter, Somerville is larger than 99% of asteroids (Mou & Webster 2021), and as a probable C-type asteroid, it is carbonaceous and of a common type: about 75% of known asteroids are C-types, though this may be an underestimate, as they are dark and difficult to detect. These asteroid types have spectra parallel to those of the CI and CM types of carbonaceous chondrite meteorites, whose chemical composition are similar to the Sun and the primitive solar nebula, without the hydrogen, helium and volatiles (Bus & Binzel 2002). The red visible spectra and low albedo of asteroids like Somerville may indicate organics but a possible absence of near ultraviolet suggests a scarcity of hydrated minerals (Tatsumi *et al*. 2025).

Asteroid 5771 was named for the Scot, Mary Fairfax Greig Somerville (1780-1872), born in Jedburgh (O'Connor & Robertson 1999). She was largely self-educated, having been actively discouraged from 'unladylike' reading by her family. Despite this, Mary's tenacity and insatiable urge for learning led her to become one of the most renowned scientists of her time, and she had many eminent associates, including Playfair, Leslie, Airy, John and William Herschel, Babbage, Laplace, and Poisson. Her treatise on Laplace's *Mécanique Céleste* (Somerville & Laplace 1831) brought her immediate acclaim, which was enhanced by her next book, *On the Connexion of the Physical Sciences* (Somerville 1834). Many honours followed, including election to the Royal Astronomical Society in 1835. The Royal Society could not elect a female Fellow and instead commissioned and displayed a marble bust by Francis Leggatt Chantrey for its premises (Hernández 2023). In the 6th edition of *On the Connexion of the Physical Sciences* in 1842, Mary's discussion of the supposed planet that led to irregularities in the orbit of Uranus led John Couch Adams to his investigations into, and accurate prediction of, Neptune (O'Connor & Robertson 1999). The name Somerville for asteroid 5771 was suggested by astronomers Simon and Jaqueline Mitton (after whom asteroid 4027 Mitton is named). Mary is also remembered as a campaigner for education and voting rights for women in Somerville College, Oxford (then Somerville Hall), founded in 1878 for female education. Sir William Edward Parry named Somerville Island in the Barrow Strait, Nunavut, for her in 1819, and Somerville is the name of a small lunar impact crater east of the crater Langrenus (Andersson & Whitaker 1982).

References

Andersson, L.E. & Whitaker, E.A. (1982) *NASA catalogue of lunar nomenclature*. NASA-RP-1097. https://ntrs.nasa.gov/citations/19830003761.

Bus, S.J. & Binzel, R.P. (2002) Phase II of the Small Main-Belt Asteroid Spectroscopic Survey: A Feature-Based Taxonomy. *Icarus 158 (1) 146–177*. https://picture.iczhiku.com/resource/paper/SyiwUawiiRzekMmN.pdf.

De Prá, M.N., Pinilla-Alonso, N., Carvano, J., Licandro, J. *et al*. (2020) A comparative analysis of the outer-belt primitive families. *Astronomy & Astrophysics 643, A102, 1-16*. https://www.aanda.org/articles/aa/pdf/2020/11/aa38536-20.pdf.

Grokipedia (2026a) *Observation Arc*. https://grokipedia.com/page/Observation_arc.

Hernández, M. (2023) *The many faces of Mary Somerville*. The Royal Society Blog, 31 October 2023. https://royalsociety.org/blog/2023/10/many-faces-mary-somerville/.

IAU (1995) The International Astronomical Union Minor Planet Circular 25444, (5771) Somerville = 1987 ST1. http://mpcweb1.cfa.harvard.edu/iau/ECS/MPCArchive/1995/MPC_19950712.pdf.

IAU (2026) The International Astronomical Union Minor Planet Center (5771) Somerville = 1987 ST1 = 1989 BG1 = 1982 YY1. https://minorplanetcenter.net/db_search/show_object?object_id=5771.

JPL (2025) Jet Propulsion Laboratory Small-Body Database Lookup, 5771 Somerville (1987 ST1) https://ssd.jpl.nasa.gov/tools/sbdb_lookup.html#/?sstr=Somerville.

Mou, J. & Webster, I. (2021) *5771 Somerville (1987 ST1)*. Space Reference, https://www.spacereference.org/asteroid/5771-somerville-1987-st1.

O'Connor, J.J. & Robertson, E.F. (1999) *Mary Fairfax Greig Somerville*. MacTutor History of Mathematics and Statistics, University of St Andrews. https://mathshistory.st-andrews.ac.uk/Biographies/Somerville/.

Somerville, M. & Laplace, P.S. (1831) *Mechanism of the Heavens*. John Murray, London. Available online: https://archive.org/details/mechanismofheaven00somerich.

Somerville, M. (1834) *On the Connexion of the Physical Sciences*. John Murray, London. Available online: https://www.gutenberg.org/ebooks/52869.

Tatsumi, E., Vilas, F., de León, J., *et al*. (2025) Near-ultraviolet absorption distribution of primitive asteroids from photometric surveys II. Collisional families. *Astronomy & Astrophysics 693, A140, 1-16*. https://www.aanda.org/articles/aa/pdf/2025/01/aa50662-24.pdf.

Warner, B.D. (2012) Asteroid Lightcurve Analysis at the Palmer Divide Observatory: 2011 December – 2012 March. *The Minor Planet Bulletin 39 (3) 158–167*. https://articles.adsabs.harvard.edu/pdf/2012MPBu...39..158W.

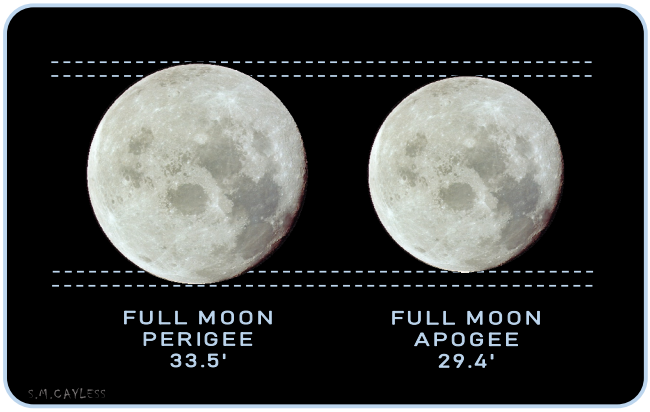
Warner, B.D. (2021) *5771 Somerville*. Asteroid Lightcurve Database (LCDB) Data for (5771) Somerville. https://www.minorplanet.info/PHP/generateoneasteroidinfo.php. Accessed 16 Mar 2026.

Image Credit

~Orbital position of Asteroid Somerville, March 2026 © Sandi Cayless.

Happy Observing!

On Monday 1 June, The Moon is at apogee, i.e. it is at the furthest point on its orbit from Earth, which makes it appear slightly smaller than often seen (*Moon illusion*). The Moon's elliptical orbit causes this 14% variation in distance from its closest point or perigee, at 356,500 km, to its apogee at 406,700 km. The angular size varies likewise, from 29.4 arcmin to 33.5 arcmin, as does brightness, but this is tricky to detect as the Moon's phases are also varying. The diagram below illustrates the apparent difference in size. The Moon is also at aphelion on 1 June, i.e. its furthest from the Sun, at 1.0166 AU.



On 7 June, Mercury as seen from Stirling reaches its highest point in the evening sky, shining at mag 0.4, although it may be difficult to see, at ~12° above the horizon at sunset. June 9 brings a conjunction of Venus and Jupiter in Gemini, where Venus passes 1°38' north of Jupiter. From Stirling, the two are visible at 11° above the western horizon about 22:35 (GMT). The Daytime Arietid meteor shower (active 14 Apr-24 Jun) reaches its peak on 10 June, and from Stirling, the shower can be seen from about 02:04, when its radiant (in Aries) is above the horizon, until dawn. The shower peaks close to New Moon, and so visibility should be good, although only about 6 meteors/hour are expected. The parent body of the Daytime Arietids may be Comet 96P/Machholz 1 but this has not been confirmed; another candidate is asteroid 1566 Icarus (Abedin *et al*. 2017; Rendtel 2014). On 15 June, the Moon reaches perigee, the closest point in its orbit around Earth, and appears slightly larger than sometimes seen. However, as this coincides with New Moon, the Moon will be lost in the glare of the Sun. June 21 is the Summer Solstice, and the longest day of 2026 in the northern hemisphere. The first day of summer is when the Sun reaches its most northerly point in the sky, in the constellation Cancer, at declination of 23.5°N. The Boötid meteor shower (active 22 Jun-2 Jul) reaches its peak rate about 27 June, with its radiant (in Boötes) highest at around 22:00 BST. The parent body of the shower is comet 7P/Pons-Winnecke. However the Moon, in Scorpius, is only 2 days from full on 27 June and is likely to interfere with viewing. The month culminates in the Full Moon of 30 June. This Strawberry Moon (aka Blackberry Moon, Raspberry Moon, Berries Ripen Moon etc.) reflects the time of year when certain staple crops are ripe and ready to harvest (Cayless 2024).

Saturn will make a close approach to the 22-day old Moon, passing within 5°58' of it on 7 July, in Pisces. The two may be seen from Stirling in the dawn sky, to reach an altitude of 20° above the SE-horizon before fading as dawn breaks about 03:21. On 11 July the Moon and M45 (the Pleiades) will pass within 1°06' of each other. Both are in Taurus, but they will be difficult to observe from Stirling, as they will reach only 14° above the horizon. Visible in the dawn sky, they will fade from view at about 03:03, as dawn begins. On 27 July, asteroid 3 Juno will be in a good position for observing. In the constellation Aquila, 3 Juno will become visible from Stirling at around 00:04 (GMT), reaching its highest point at 01:05, 28° above the horizon.

There are a few meteor showers that peak around 29-30 July, and if you see a stray meteor around this time, it may be a Piscis Austrinid (active 15 Jul-10 Aug), although this shower has a very low hourly rate (<1 from Stirling). It has no known parent body, but the 2026 Southern δ-Aquariids (active 12 Jul-23 Aug), of parent body comet P/2008 Y12 (SOHO), may show around 7 meteors/ hour over Stirling, some with long-lived trails. The α-Capricornids (active 3 Jul-15 Aug) might produce ~2 meteors an hour. The parent body of this shower is comet 169P/NEAT. Alas, as July's Full Moon, often known as the Buck Moon, to mark the time when male deer grow new antlers (Cayless 2024), reaches full on July 29, viewing will be hampered.

Comet 10P/Tempel is likely to reach its brightest point of the year on 3 August, at 1.42 AU from the Sun, and 0.41 AU from Earth. The comet will be very difficult to spot from Stirling, as it never rises more than 8° above the horizon, but for those travelling south to sunnier climes, it may be an object to look out for. However, at home, the conjunction of the Moon and Saturn in Pisces should be visible from around 23:01 (GMT), to reach an altitude of 35° above the southern horizon. On 7 August, the Moon and M45 (the Pleiades) pass within 1°12' of each other and should be visible from about 23:06 (GMT) until around 04:13, in Taurus. The conjunction of the Moon and Mars on 9 August is also a visible event.

However, the New Moon of **12 August** brings one of the most spectacular of astronomical events, a **total solar eclipse.** [This is the best solar eclipse seen in the UK since the one of 11 August 1999, when, alas, the cloud came in, although the dark shadow racing across the sea and the resultant chill, silence and darkness felt on a hilltop in Devon, not to mention the noise of the popping of myriad champagne corks at the moment of totality, contributed to a rare experience – Ed]. From Stirling (barring clouds), at the moment of greatest eclipse (**19:07 BST**), the Sun's disk will be obscured to 90%, although further south in Great Britain, the Sun will be eclipsed up to 96%. For those planning a holiday at this time, totality will be visible from Iceland, Mallorca and Ibiza. The Royal Observatory Greenwich will be live-streaming the eclipse.

NB Eclipse safety: Never look at the Sun directly, even during a total eclipse. Viewing through *any* optical instrument can cause instant and permanent blindness. Telescopes should be fitted with certified filters and humans should be fitted with appropriate eclipse glasses. Alternatively, a safer way to view solar eclipses is to project the image. Solar projection boxes are readily available – these, usually a cardboard box with a small lens, project an enlarged image of the Sun onto a built-in white cardboard sheet. These are also useful to view sunspots after the event, and very good for group viewing. For those handy with wood, tools and who have a spare pair of binoculars, a very good guide to building your own durable device is available (Parrish 2024).

The Perseid meteor shower (active 17 Jul-24 Aug) reaches its 2026 peak on 13 August, at around 03:00 BST. The radiant of this strong shower will appear at a peak altitude of 72° above the horizon, and over Stirling, up to 143 meteors/ hour are expected. With the peak close to New Moon, interference will be slight. The parent body of the Perseids is comet 109P/Swift-Tuttle. On 14 August, Venus reaches its greatest distance from the Sun (greatest elongation east). Elongation is when a planet is farthest from the Sun, and thus more likely to be above the horizon when the Sun has set, making viewing, particularly of Venus and Mercury, easier. From Stirling, this particular sight will tricky to observe, as the planet will peak at 20° above the horizon at sunset, but Venus is so bright that it is the third brightest object in the sky after the Sun and Moon.

On 14 August, globular cluster M15 (NGC 7078) in Pegasus reaches its highest point at 01:12, remaining visible all night, and will make a good object for astrophotography. The waxing crescent Moon should not be an obstacle. The following night of 15 August, globular cluster M2 (NGC 7089) in Aquarius will make a good object. The 18 August brings the peak of the κ-Cygnid meteor shower (active 3-25 Aug). The best displays above Stirling will occur around 23:00 BST, when its radiant point is highest, although only about 2 meteors/hour are expected. The κ-Cygnids have no known parent.

The partial lunar eclipse of 28 August will be tricky to see from Stirling, as the Moon will set partway through the eclipse. It will be -4° above the horizon at the start of the eclipse at 02:25, with maximum occurring at 05:14, when 93% of the Moon's disk will be shadowed. At 06:53, the Moon will be fully outside the Earths umbra, signalling the end of the partial eclipse. This also means that the Moon is at full, and this August Full Moon is often called the Sturgeon Moon, as it heralds the season when the lake sturgeon (*Acipenser fulvescens*) is most abundant (Cayless 2024). August ends on the 31 with a conjunction of the Moon and Saturn, when the two will be visible from about 22:31, at 10° above the eastern horizon, reaching their highest point of 36°at 03:31.

Happy observing all!

References

Abedin, A., Wiegert, P., Pokorný, P., Brown, P. (2017) The age and the probable parent body of the daytime Arietid meteor shower. *Icarus 281, 417-443*. https://doi.org/10.1016/j.icarus.2016.08.017.

Cayless, S. (2024) Full Moons and Their Names. *The Jeety Starn, No 5, Dec 2024, p10-15*.

Rendtel, J. (2014) Daytime meteor showers. *Proc. International Meteor Conference 2014, Giron, France*. https://www.researchgate.net/publication/276795770_Daytime_meteor_showers.

Parrish, M. (2024) Build a solar projector to safely observe the Sun or solar eclipse. *BBC Sky at Night Magazine, March 15, 2024*. https://www.skyatnightmagazine.com/advice/diy/build-solar-projector-observe-the-sun. Accessed 24 Feb 2026.

Many thanks to all our contributors to this quarter's issue of *The Jeety Starn*. Members, please hand submissions to the editor, or any contributions can be sent via the Society's contact email address. Illustrations and snippets also welcome!

The Jeety Starn

The Jeety Starn
ISSN 3029-0848

No. 11, June 2026
Publisher: Stirling Astronomical Society, Stirling
Editor: S.M.C. Cayless

Contact us at:
contactstirlingastronomy@gmail.com
www.stirlingastronomicalsociety.org.uk