

# Caroline's Almanac

A seasonal guide to the night sky

Spring Skies March to May



HERSCHEL  
MUSEUM OF  
ASTRONOMY



The evening sky can be spectacular in spring as the path of the Sun, Moon and planets (the ecliptic) is at its steepest angle to the western horizon. Darkness arrives swiftly and the planets remain longer in good 'atmospheric seeing' (with less atmospheric disturbances); the less disturbance, the more detail you can see.

## The Northern Vernal Equinox

The Sun crosses the celestial equator (on the same plane as the equator of Earth) twice each year. Around 21-22 March it moves from the southern celestial hemisphere across to the northern. This is the Equinox - meaning 'equal night'. In the UK (north of the equator), it is the Spring or Vernal Equinox.



Path of the planets, Stellarium 23.1

The point at which the Sun crosses from southern to northern hemispheres is known as the First Point of Aries – named after the constellation where this took place many years ago. Since then, the Earth has continued its 26,000 year wobble and so the crossing point is now in modern day Pisces.

## Zodiacal Light and Gegenschein

The plane of the Solar System is a dusty place. Normally hidden, the microscopic dust can appear when the Sun is at the right angle and skies are dark enough.

Around 60 minutes after sunset, a pyramid of faintly glowing light may be seen stretching upward from the western horizon. This is the Zodiacal Light and is the product of sunlight reflecting off that dust. Get away from light polluted skies and look around the time of a New Moon and you'll increase your chances of seeing it.

Around 1:00am under very dark skies, the point in the sky opposite the Sun, the antihelion, is high and a second fainter dust glow might become visible. It is called Gegenschein and is a patch about 10 degrees in diameter, about as bright as the dimmer parts of the Milky Way.

## Messier's Masterpiece

Charles Messier (1730-1817) was a French astronomer and contemporary of William Herschel. He got his first astronomy job at the age of 21 and discovered his first comet by the time he was 30. He went on to discover a further 12 'many-tailed visitors' to the inner Solar System and this earned him the title of 'Ferret of Comets' by King Louis XV.



Charles Messier © Cambridge University Press

Despite this accomplishment he is best known for his list of non-comets or *Catalogue des Nébuleuses et des Amas d'Étoiles*. In his hunt for comets, Messier compiled a list of 'fuzzy objects' as he eliminated them from his search. By the list's final version in 1784, it contained 102 'fuzzy objects' seen in the skies over Paris. The list of Messier objects is still used by amateur astronomers today. It has been revised in the last century based on Messier's notes to list 110 objects including what we now know to be open clusters, globular clusters, planetary nebulae, supernova remnants, nebulae and galaxies.

Numbered from 1 to 110, you'll see them written as Messier 42 or M42, but you'll notice some get grander names like the Great Nebula in Orion. They are all accessible in amateur telescopes from most UK latitudes.

## A Lazy Marathon

Springtime provides the best conditions for trying to see as many Messier objects as possible in one night. The challenge is named the Messier Marathon and was popularised in American astronomy clubs from the 1970s onwards before coming back across the Atlantic as telescopes became accessible to amateurs. The challenge is best undertaken with a computerised GoTo telescope and as a group of stargazers on a moonless night in March or April. A Messier Marathon list (available online) will provide you with the best order to go about finding the objects during the night.



## The Spring Sky

March brings us the spring constellations with the stars Arcturus, Capella, and Vega first visible after sunset. The Plough is overhead and an easy point to start navigating from. Follow the curved handle of the Plough to the southeast and you find Arcturus in Boötes (pronounced 'boh-OH-teez'). Extend the curve the same distance again and you get to Spica in Virgo just below the line of the ecliptic. The westerly end stars of the Plough (Dubhe and Merak) can trace a line northward to Ursa Minor and Polaris, the North Star, or can trace southward to the constellation of Leo, the Lion, and its bright star Regulus.

With Spica and Regulus found, the curve of the ecliptic becomes easier to imagine, running through Cancer the Crab, Gemini the Twins, and Taurus the Bull, off to the west. It's on this imaginary line you'll find the planets, most asteroids, minor planets, and the Moon. It remains reasonably high in the sky and so Solar System objects tend to be in clearer, less turbulent air if the weather permits.

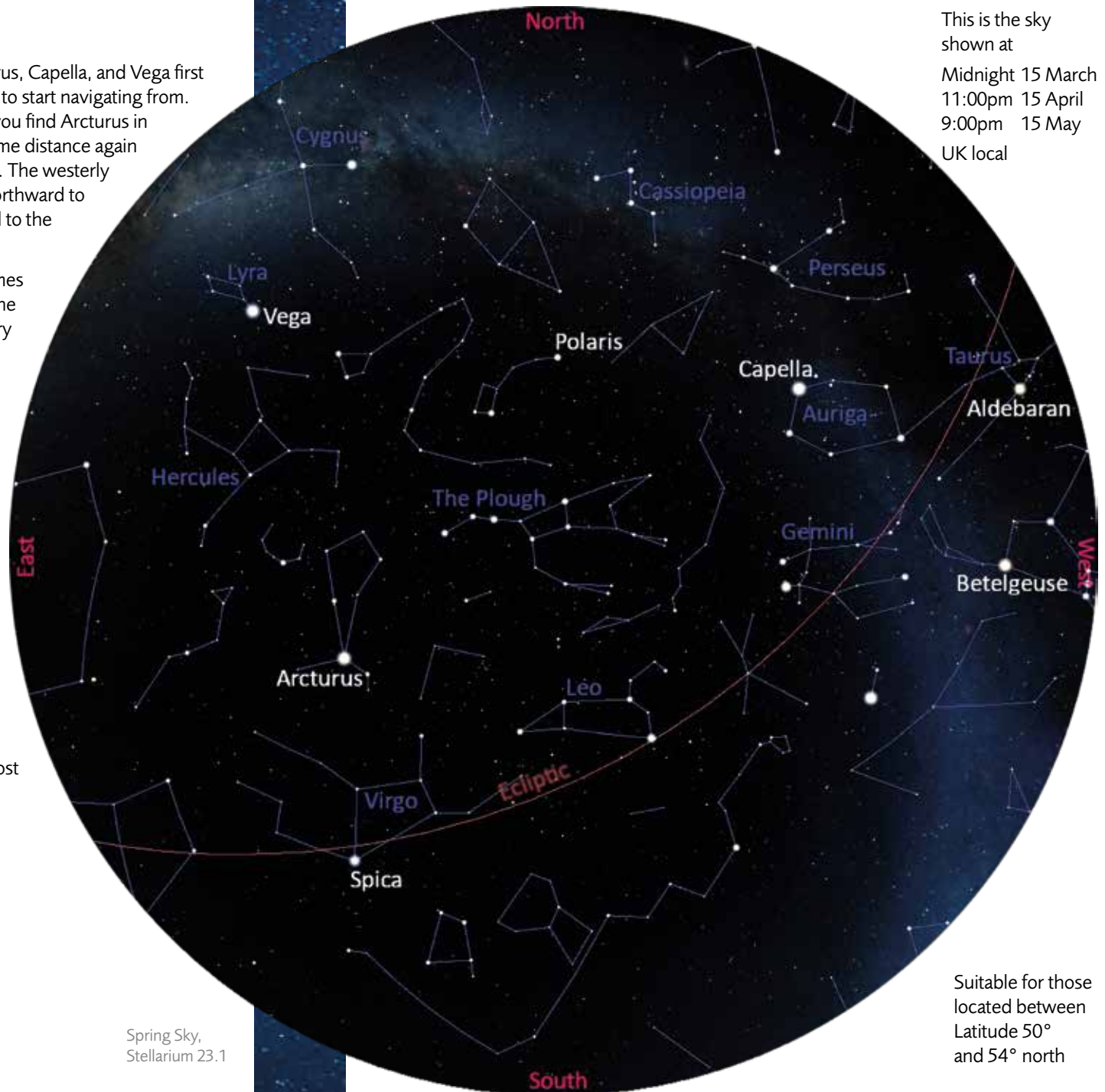
Throughout spring, the Sun travels through an area of the sky with few Messier objects making it a great time to try to view the rest in a single night. The area below Arcturus and the Plough is rich in deep sky objects, mostly galaxies, so observing around Leo, Coma Berenices, and Virgo is always rewarding. To get the best from them, the Moon needs to be out of the way, so the weekends around New Moon in early spring are particularly popular with amateur astronomers.

With the clocks in the UK going forward during the last weekend of March, it often seems the night sky becomes less accessible. However, this makes the morning sky so much easier to reach and this is where you'll find planets that were lost to the Sun in prior months.



See today's stars  
online with Stellarium

Spring Sky,  
Stellarium 23.1



This is the sky  
shown at  
Midnight 15 March  
11:00pm 15 April  
9:00pm 15 May  
UK local

Suitable for those  
located between  
Latitude 50°  
and 54° north

## George's Star

On a springtime evening in March 1781, William Herschel set up his 7ft telescope in the garden of 19 New King Street, Bath, to continue his methodical sweeps of the night sky looking for changes to the sky he'd surveyed many times before. His routine was little changed on Tuesday 13 March, except for the absence of his sister Caroline, who was organising their final belongings in Rivers Street following the recent family move back to New King Street.

As William swept the telescope's view up through the constellation Taurus and on towards Gemini, he noticed something different. An object larger and brighter in the field of view compared to the other stars. It offered no other indications of its nature so he noted his findings and continued his sweep. His note for the evening reads *'In the quartile near zeta Tauri, the lowest of two is a curious, either nebulous star or perhaps a comet. A small star follows the comet at 2/3 of the field's distance.'* William didn't return to this patch of the sky until the following Saturday 17 March. Upon doing so he saw that the mystery object had moved slightly, but its form had not changed. He wrote to the Royal Society and Astronomer Royal, Nevil Maskelyne, suspecting he had found a comet.

Within months the orbit was computed. It was that of a planet rather than a comet, and William gave it the name **Georgium Sidus** (George's Star), after King George III. This name was not popular across Europe, and an alternative of **Uranus** was put forward by Johann Elert Bode in 1783. This name stuck, but was not unanimously settled on until 70 years later.

Pleiades Cluster © Roger Hyman

## One Eye or Two

Don't be too quick to dismiss binoculars when taking up stargazing. A good quality pair of binoculars with 40 to 50 mm objective lenses and a magnification of 7 to 10 times e.g. 7 x 40 or 10 x 50, will give you the best views of open clusters and the star fields across the Milky Way. They are also invaluable in helping you scan for planets, comets, and deep sky objects before using a telescope.



## Caroline's Comets

Caroline Herschel was a prolific discoverer of comets: huge icy dirt balls orbiting our Sun, comprised of the remnants of the material that built the Solar System. She found 8 comets over an 11 year period from 1786 to 1797. Of these, two were rediscoveries of previously known comets C/1793 S2 (Messier) and 2P/Encke. Two were co-discoveries - 35P/1788 Y1 (Herschel-Rigollet) and C/1797 P1 (Bouvard-Herschel).

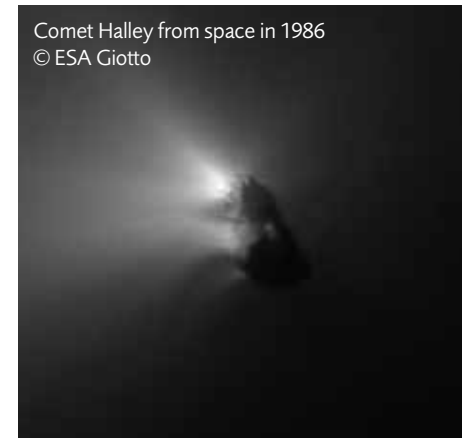
Four belong entirely to Caroline - C/1786 P1 (Herschel), C/1790 A1 (Herschel), C/1790 H1 (Herschel), and C/1791 X1 (Herschel). Of her comets, only 35P/1788 Y1 has been seen again, on its return in 1939.



35P/Herschel-Rigollet in 1939  
© Hamburger Sternwarte, Fachbereich Physik,  
MIN-Fakultät, Universität Hamburg

## Seasonal Meteor Showers

Comet Thatcher (C/1861 G1 Thatcher) last cruised by the inner Solar System in 1861 but its calculated orbit suggests it'll be back in 2283 after a 415 year loop. The debris trail it leaves behind is thought to be the source of the annual Lyrid meteor shower. The Lyrids run from 14-30 April and peak on the night of the 22-23 April. The reasonably bright, fast meteors associated with the shower can reach a rate of 10 to 20 per hour with notable outbursts in multiples of 60 years. The last of these was in 1983. The apparent source or radiant in the sky is in the constellation of Lyra.



Comet Halley from space in 1986  
© ESA Giotto

Comet Halley (1P/Halley), the famous comet that appears every 74 to 79 years, potentially gives rise to two annual meteor showers. The Orionids in October and the Eta Aquariids from 19 April to 28 May. Each is named after the constellation in which the radiant appears. The Eta Aquariids peak on the evening of 6 May and in ideal conditions can number over 50 per hour before sunrise when the point of origin is highest in the east southeast.



## Your Best Eyes

The human eye is remarkable. It can work in bright sunshine and almost total darkness, spotting colour and movement all around. However, you can still improve your stargazing by giving it a bit of a hand. If you want to see faint things, try to remove any unnecessary sources of light like mobile phones. Observe when the Sun is well below the horizon and the sky is moonless. Travel to a location with less light pollution from streetlights and buildings.



Allow your eyes 15 to 20 minutes to get used to the darkness (dark adaptation) before trying to find faint deep sky objects visually or through the eyepiece. If you can't see the object through the eyepiece and you are sure it should be there, tap the side of the telescope gently to shake the image slightly. This motion may allow the eye's rod cell to detect the object's shape. If this doesn't work for you, try averted vision where you look to the side of an object rather than directly at it. This uses the very light sensitive peripheral rod cells in your eyes rather than the colour sensitive cone cells concentrated in the centre of your vision.

## About Us



HERSCHEL  
MUSEUM OF  
ASTRONOMY

The Herschel Museum of Astronomy is dedicated to the achievements of the Herschels: distinguished astronomers and talented musicians. It was from this house that William discovered Uranus in 1781.

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Bath Astronomers are Bath's local community of stargazers dedicated to sharing their fascination with the night sky. They bring telescopes and astrophysics to the public, school classrooms, and community groups.

bathastronomers.org.uk



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