

Caroline's Almanac

A seasonal guide to the night sky

Summer Skies June to August



HERSCHEL
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ASTRONOMY

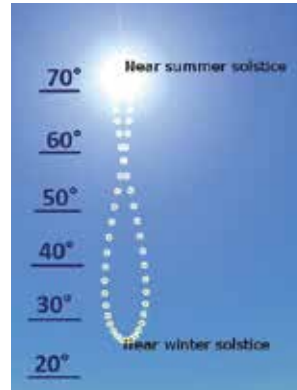


You might think that astronomy is only for when it is cold and very dark, but the summer months are some of the best times to look up at the night sky. What's not to like about enjoying astronomy wearing a t-shirt, shorts and flip flops? Relaxing on a lounge with a nice drink, and several thousand super-hot gigantic stars above you.

The Longest Day

The Summer Solstice occurs in the Northern Hemisphere around 21 June. That day the Sun is up for around 16.5 hours over Bath. The duration of the longest day varies depending on where you are: the further north you go, the longer the day will last.

With longer days come shorter nights, and it doesn't get as dark as other times of the year. At around lunchtime, the Sun is the highest in the sky it gets all year. It'll continue its journey over the following days and weeks, getting lower until the Winter Solstice. The Earth's progress around the Sun is sometimes slow and sometimes fast. If you take a photo at noon every day and combine them, you can make the Analemma – the shape the Sun traces out each year.



Analemma,
Stellarium 23.1

Ice Clouds

You might notice electric blue ripples low in the sky, shortly after sunset and before sunrise. It may be summer, but these polar mesospheric clouds (or noctilucent clouds) are caused by ice crystals forming high in the Earth's atmosphere. The ice crystals form around microscopic meteoritic dust, and they are very effective at reflecting light from the Sun just below the horizon.

Noctilucent Clouds © Roger Hyman



Seeing Stars

The first stars to appear each evening should be visible around 45 minutes after sunset, about 10:00pm in early June and 8:45pm by late August.

The constellations, ancient and modern dot-to-dot star patterns, can help you find your way around the night sky. There are, however, other simpler shapes you can spot. These are called asterisms. One of the most well-known is the Plough (also known as the Big Dipper). This familiar shape never sets below the horizon from the UK, and you can see it in the summer months about halfway up the sky in the west.

The Summer Triangle

One of the clearest asterisms in the sky is a pattern of three stars making a large downward pointing triangle. Vega in the constellation of Lyra (the Harp), Deneb in the constellation of Cygnus (the Swan), and Altair in the constellation of Aquila (the Eagle). Visible from summer through to early winter, you'll spot bright Vega first, high above you and slightly to the east. Deneb is slightly lower and to the left by 40 degrees. Altair is a similar distance from Vega but pretty much straight down in the summer months.

This group of stars is useful to help you find other things in the sky. For instance, the side of Deneb and Altair is in line with the Milky Way. Follow this line to the north and you'll find the constellation of Cassiopeia; it looks like a big W or zig-zag. Cassiopeia is visible throughout the year as it never sets in UK skies.



Summer Triangle,
Stellarium 23.1



See today's stars
online with Stellarium

The Summer Sky

The first stars you can see each evening will be Arcturus, Capella, and Vega.

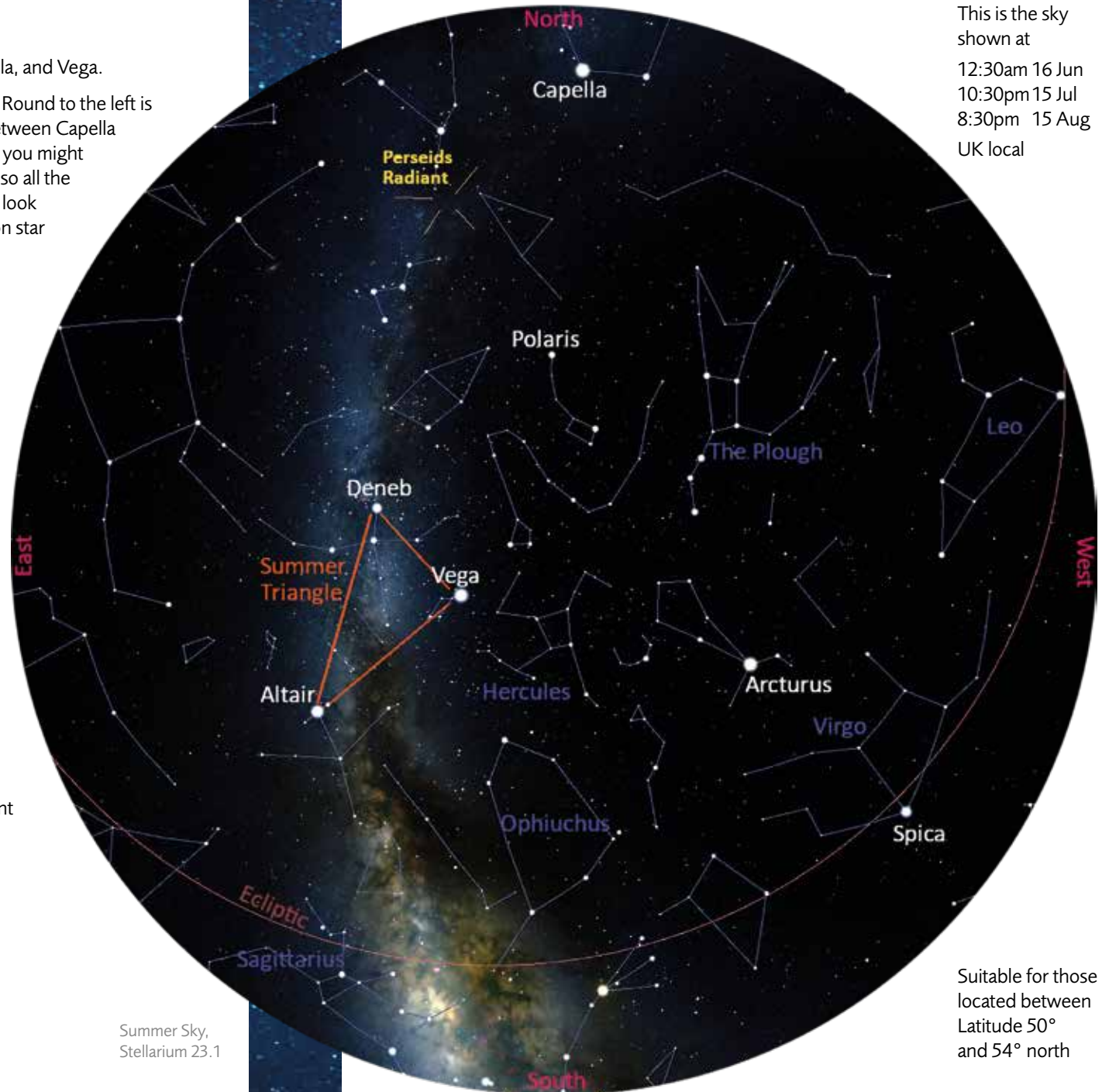
First, look south: the Bear Watcher, Arcturus, is high in the sky. Round to the left is Vega. Capella is above the northern horizon. About midway between Capella and Vega, you find Polaris, the North Star. Polaris is fainter than you might expect, but it sits almost in line with the Earth's axis of rotation, so all the stars in the sky appear to rotate about this one point. If you can look through a telescope, you'll see that Polaris has a faint companion star beside it. They orbit each other.

The Plough, part of the Ursa Major constellation, is just over 30 degrees to the west of Polaris. The mid star of the asterism's handle is a multiple star system, Mizar-Alcor. William Herschel was fascinated by multiple star systems and spent years proving they weren't just line of sight effects.

Away from light pollution, the faint band of the Milky Way is visible arcing eastward from Capella in the north, down beneath Vega, to touch the horizon in the south. Grab a pair of binoculars to pan across the bulk of the Milky Way between Vega and Aquila and you will see the variation in density of the star fields from just a few to countless swarms. You are looking at hundreds of millions of stars!

The path of the Sun, planets and the Moon runs from the southeast to the west. It is called the ecliptic and is the band where you find the constellations associated with the Zodiac. Many of these constellations are hard to spot as they are mostly drawn with dimmer stars, but Virgo is easier with its bright star Spica sitting below Arcturus. Similarly, Leo has Regulus and is easily found on a line from Polaris through the rightmost stars of the Plough and down the same distance again. The whole area between Virgo and Leo is rich with distant galaxies which you can see through a small telescope.

Summer Sky,
Stellarium 23.1



This is the sky shown at
12:30am 16 Jun
10:30pm 15 Jul
8:30pm 15 Aug
UK local

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

Next Stop Hercules

Constellation Hercules, Stellarium 23.1

Visible to the south and almost overhead as darkness falls, is the constellation of Hercules. To find it, look for the bright star Vega in Lyra, and then hop an outstretched handspan to the right. The body of a human figure is suggested by two polygons of stars sharing a cinched in waist and arms and legs off each corner.

What makes Hercules interesting is Messier 13 (M13) – The Great Globular Cluster. This huge ball of stars, over 300,000 of them, is orbiting the Milky Way at a distance of 22,200 light years. In our part of the galaxy there are only a few thousand stars in a similar volume of space, but if you lived on a planet around a star in M13, the light from the stars would create constant day time.

William Herschel was fascinated by our position in space and measured the motion of stars around us. He discovered that our Sun and its planets are moving towards the constellation of Hercules. This was the first inkling that we are orbiting the centre of the Milky Way.

William's curiosity led him in 1785 to devise a way to determine the shape of a section through the Milky Way. He counted how many stars could be seen through the eyepiece of his telescope as he made a big circle around the sky. In this way he estimated how far out the edge of the Milky Way was – the more stars recorded the further out the edge of the Milky Way. Here is his section:



The Moon

Every 29.5 days the Moon changes shape through four distinct phases. One day after New Moon, the slimmest of crescents can be seen as the Moon waxes (builds) through First Quarter to Full Moon. It then begins to wane (reduce) to Last Quarter and finally a barely visible crescent on the opposite side. Each phase lasts approximately a week.

The Moon is commonly associated with the night, but it can also be visible during the day – although a Full Moon is only visible at night. For the first 14.75 days from a New Moon, it is visible in the afternoon, although it doesn't always stand out strongly against the blue sky. After Full Moon, it is visible in the morning sky.

Native American culture has given us the names used today for different full moons. There are also traditional Celtic and Anglo-Saxon names for our seasonal moons:

- June** The Dyan Moon, Flower Moon, Horse Moon, Mead Moon, Planting Moon and Rose Moon.
- July** The Claiming Moon, Hay Moon, Herb Moon, Mead Moon and Wyrth Moon.
- August** The Corn Moon, Dispute Moon, Grain Moon, Lightning Moon and Lynx Moon.



Moon over Glastonbury Tor
© Roger Hyman

The Perseid Meteor Shower

Each year, the Earth orbits the Sun and travels through the debris of comets and asteroids. This debris, mostly the size of grains of sand, heats up as it encounters and plunges through the Earth's atmosphere, producing bright trails we observe as meteors.

The Perseids debris cloud was left by Comet Swift-Tuttle and is particularly rich. The Earth gets to the centre of the debris cloud around 13 August each year. The shower can be observed before and after the peak for a few weeks. All Perseids will appear to have originated from an area of the sky just above the constellation of Perseus. The best numbers of meteors are seen after midnight and on moonless nights.

Measuring Celestial Distance

The sky is a big place, and the objects in it appear quite small. Spin around once looking at the horizon. That is 360 degrees. Consider the Moon is only 0.5 degrees wide when it is full, and you begin to appreciate you need an easy way to measure distance across the sky.



© Simon Holbeche

Outstretch your arm above and in front of you and look at how much sky your fingers or hand cover. Your little finger will cover the Moon or the Sun twice over, i.e. 1 degree. Holding three fingers like a Scout salute is about 5 degrees. Your fist from knuckle to knuckle is about 10 degrees. Your outstretched fingers cover about 25 degrees of sky.

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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.

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