

Dark Sky Tourism

A brief user guide to the sky and equipment

Designations

About 90% of British people have never experienced a really dark sky. Yet interest in stargazing has never been higher. That opens up new possibilities for tapping into the market for dark sky tourism. Because dark areas are so important in the crusade against light pollution new designation schemes have been created. The UK Dark Sky Discovery project is run by the Royal Observatory in Edinburgh and designated over 150 places for people to view the heavens safely. In the Dales we have three: Hawes, Malham and Buckden. Dark Sky Parks are a much higher level of designation overseen by the global International Dark Skies Association (IDA). These are protected areas of top quality night sky with lighting management plans endorsed by local authorities/national parks. The biggest in Europe is Northumberland International Dark Sky Park. Other IDA preserves in the UK are:

Isle of Col (community)
Brecon Beacons (reserve)
Exmoor (reserve)
Galloway (park)
Sark (community)
Moffat (community)
Elan Valley, Wales (park)
Snowdonia (reserve)
South Downs (reserve)

What can you see under our dark skies?

Most of the UK's population live in densely populated and light polluted urban areas. They see a handful of stars through an orange glow. Under our skies your eyes can feast on up to 2,000 at any one time. From our patch the furthest object you can see with your naked eye is the Andromeda Galaxy – a vast island of stars very similar to our own Milky Way. Difficult to glimpse from built up areas, we see it in all its glory looking like an elongated glow set amongst the stars. Use binoculars and you will see its arms stretch out on both sides from a bright central core. This amazing object is 2.5 million light years away! Meteor showers are also best viewed from dark locations. These 'shooting stars' are grains of dust from the tails of comets burning up when they enter the Earth's atmosphere. A website called Needless Light Pollution will show you how dark your local skies are: www.need-less.org.uk

When is the best time to observe?

Mid-summer nights don't get properly dark. So from early May to late July the sky may look beautiful, but you won't see as many stars. During the rest of the year the only obstacles are the weather and the moon. The latter is a wonderful object to view with a scope or binoculars, but its light does wash out the fainter stars. The starriest view of the heavens comes when the moon is out of the way – the so-called new moon period. Most diaries will tell you when this is. But of course the moon itself is an attraction. The best time to view it is when it is in a partial phase, for instance first quarter. You will be rewarded with views of craters and mountain chains cast into sharp relief by slanting sunlight. Planets are unaffected by the moon's presence and Jupiter,

Saturn, Venus and Mars can all be observed when above the horizon. Our view of the stars also changes through the year as the Earth orbits the Sun so there's always something new to see.

Spring

A great time to view brighter galaxies and planets like Jupiter and Saturn are also well placed. Nights are still long and the weather is warming up so it's a great time to observe. The constellation of Leo dominates the southern sky.

Summer

You will see fewer stars around mid-summer, but watch out for ghostly noctilucent clouds high in the sky. You will also see tantalising glimpses of the Milky Way to whet appetites for the months ahead. Watch out for August's Perseid meteor shower – one of the year's best. Truly dark skies return at the end of July for northern parts of the UK.

Autumn

Together with the spring this is a prime viewing time. Nights are properly dark and the Milky Way is overhead in the evening, resembling a shimmering river of stars. Star clusters also look fantastic. Meteors showers like the Orionids can put on a good show in October.

Winter

The season of sparkling skies! The sky is often at its most transparent as temperatures dip. Glittering star clusters and magnificent constellations like Orion grace the sky, along with bright nebula. The Geminids meteor show in December is one of the year's best. Wrap up warm and the rewards can be amazing.

Dark sky friendly/marketing

Astro tourism has grown in popularity. To tap into this market promote yourself as a dark sky destination and provide equipment. Some key points:

Draw attention to our starry skies in social media marketing. Use images and videos and keep it light on words. Let the pictures speak for themselves.

Use key messages:

- The Dales is one of England's darkest areas and great by night and day.
- We see thousands of stars overhead compared with a handful from towns and cities.
- See the Milky Way in all its glory, along with distant galaxies and sparkling star clusters.
- Our dark skies are also good for nocturnal wildlife like owls and moths.

Make your property more dark sky friendly. Do you have a place in the garden where people can observe away from the glare of lights? If you have external lighting make sure it is well hooded so the light shines down. And use a motion sensor so it's not all the time. Perhaps consider hosting star parties and/or provide basic equipment for novices. Read on.

Equipment



about £89.

But what about telescopes? Should you get one? Well they do give better views of planets and star clusters, but the downside is that they are more difficult to use. They have a narrower field of view so finding objects can be tough at first.

If you do opt to buy a scope keep it simple and portable. You can spend hundreds (and thousands!) of pounds on hi-tech instruments which automatically slew to objects and track the stars as they move across the sky. But there is a learning curve involved and what we want to do is make the sky accessible. So a good option would be a very simple wide-field refractor type telescopes (which uses a lens to collect light) on an equally simple, but stable tripod and mount called an Alt-Az mount – which allows the telescope to be pushed up and down and left and right. You don't need to spend a fortune. The telescope illustrated (Startravel 102) retails for about £190. It will not automatically track the stars – you have to push it – but it is very easy to use and offers nice views. You will be able to spy the rings of Saturn, lunar mountain chains and brighter nebula where stars are born. This kind of set-up is pretty much maintenance free.



A more powerful but simple to use telescope is a reflector on a Dobsonian mount. Instead of using a lens to collect the light, it uses a mirror. You look through the telescope at the top. Because mirrors are cheaper to make than lenses, you get more telescope for your money. Again this kind of set-up will not automatically track the stars so you move it manually up and down and left and right. The model shown is called a Skyliner 200 – it costs about £285, but offers four times the light gathering power of the refractor above. But it is not as maintenance free and to get the best from it you will need to learn a simple procedure called collimation which ensures optics are well aligned to provide good views. They are also more bulky than smaller telescopes.

Sound advice is to buy from a reputable dealer in astronomical products (scroll down). Many department store telescopes are terrible and almost impossible to use.

Eyepieces

A telescope is used to collect as much light as possible. The bit that actually magnifies the image is called the eyepiece – a lens, similar to those used in eye glasses. When you buy a telescope a few eyepieces are usually included. These will have numbers printed on them, for instance they may include a 10mm and 20mm eyepiece. The lower the number the higher the magnification you can expect, but also the dimmer the image. It's a trade off. To work out the magnification your telescope will produce simply divide the focal length of your telescope (which will be stated on the scope itself or in the instruction manual) by the number on the eyepiece. So if your telescope has a focal length of 1000mm and you insert a 10mm eyepiece you will achieve a magnification of precisely 100x. You can get very decent quality eyepieces for £25 upwards and shopping second hand is a great way to buy and save (scroll down).

Red torches



Preserving night vision is important when viewing the stars – you see so much more when your eyes are attuned to low light levels. It takes 20 minutes for your eyes to get adjusted, but white light destroys this in seconds and means you have to start again! However, red light can be used without much of a detrimental effect. They are great for reading star maps and also offer security when walking in the dark. They can be found online for around £10.

Lost in space?

Smartphone apps have come on leaps and bounds and are much easier for a novice to use than an old star map. There are scores of available for iPhones, Android and Windows devices. They help you understand the night sky and keep up with events. Here's a selection

Google Skymap – identifies the stars using GPS when you hold up the phone to the sky.

<https://play.google.com/store/apps/details?id=com.google.android.stardroid>

Meteor Shower Calendar – tells you when showers are due and if the moon will spoil the show.

<https://itunes.apple.com/us/app/meteor-shower-calendar-free/id579332001?mt=8>

ISS Detector and ISS Spotter – both will alert you when the ISS is due to pass overhead.

<https://play.google.com/store/apps/details?id=com.runar.issdetector>

<https://itunes.apple.com/gb/app/iss-spotter/id523486350?mt=8>

Aurora Alert – predicts possible Northern Lights displays.

<https://play.google.com/store/apps/details?id=com.eaglesorbit.auroraalert>

Other good ideas

Reclining chairs in gardens are great to relax and gaze skywards in comfort. They are also a perfect way to watch meteor showers without getting a sore neck. You soon get cold when you are stood or sat outside in the night, even in the summer, so dress in layers.

Astronomical Happenings

Anyone who has spent a few hours under the night sky will tell you there is lots happening up there! Keep your eyes peeled for big astronomical events like meteor showers. The better ones are nearly always flagged up by the national media. Showers are best seen when the moon is

absent, which varies from one year to the next. During good outbreaks you can expect to see as many as a couple of meteors per minute. The best ones are the Perseids in August, Orionids in October and Geminids in December.

Aurora

The Northern Lights can be magical. The further north you are and the darker your sky the more chance you have of seeing them. It is difficult to predict when they will occur, but you can sign up for alerts on when they might be visible at aurorawatch.lancs.ac.uk/alerts where you can find out more about what creates this wonderful light show. Also see the apps section above.

Bright man-made satellites/ISS/Iridium Flares

Watching man-made satellites scuttling across the night sky makes great viewing and is the source of many false UFO sightings. The International Space Station (ISS) in particular is very bright and seen over UK skies at intervals. Another fabulous kind of object is called an Iridium Flare – caused by the solar panels of a rotating artificial satellite catching the sun. For a few seconds the small spacecraft can become by far the brightest object in the night sky with a real 'wow-factor'. Predictions for all these events are available at a brilliant website called www.heavens-above.com and via apps already mentioned.

Useful resources

Stellarium Interactive planetarium programme. Easy to use and shows the night sky realistically. Free and available for Windows and Mac. www.stellarium.org/en_GB/

Society for Popular Astronomy Good source of information - www.popastro.com

Green Witch West Yorkshire based reliable astro retailer - www.green-witch.com

Ian King Imaging Reliable astro retailer - www.iankingimaging.com

Grovers Optical Northallerton based reliable astro retailer. <http://grovers.biz/optics/>

Rother Valley Optics South Yorkshire based reliable astro retailer - www.rothervalleyoptics.co.uk

UK Astro Buy and Sell Well used by astronomers to buy and sell used gear. www.astrobuysell.com/uk

Novice's books

Turn Left at Orion

<http://www.tringastro.co.uk/turn-left-at-orion-2004-p.asp?gclid=CPfj8PzdvtACFawW0wodltwNng>

Stargazing for Dummies

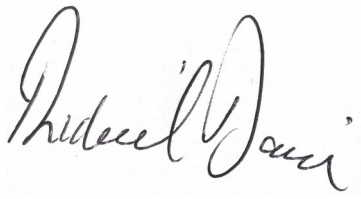
<http://bookshop.blackwell.co.uk/bookshop/product/9781118411568?gclid=CObwuaLdvtACFZQW0wodBfII6A>

Further information and advice.

Please feel free to contact me at any time. I have posted astro images you can use in your own marketing with a suitable credit and also a monthly podcasts on what can be seen in the night time sky for you download/distribute. Go to <http://darkskiesuk.org>

Clear skies!
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A handwritten signature in black ink, appearing to read "Richard Darn". The signature is written in a cursive style with a large, prominent initial 'R'.