

# An Astrotourism Business Toolkit

For accommodation businesses,  
activity providers & food businesses







Milky Way above twin arch bridge on the Rail Trail/Tom Mutton

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# Introduction

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This guide is designed for tourism businesses to help you understand more about dark skies, astrotourism and the opportunities it provides in the North York Moors National Park.

It's a little known fact that the North York Moors is the driest upland area in the UK. Drier air provides greater clarity, which is why many astro experts highly rate the National Park for its stargazing potential.

**In addition, in December 2020, we were designated an International Dark Sky Reserve by the International Dark-Sky Association, one of only 18 in the world. So we're now officially one of the best places to see stars.**

Our stars are also an economic asset – just as people have long been attracted by our landscapes, coastline, wildlife, and historic sites, now our night skies offer another compelling reason to visit.

With easily accessible public viewing, numerous dark locations and regular events organised by astronomers and activity providers, this guide will show you how to tap into the astrotourism market.



Meteor above Helmsley/Steve Bell



# Why are dark skies important?

While one of our aims is to help you develop astrotourism and off-peak business, there are many other benefits to enjoying and maintaining dark skies:





## Dark sky credibility

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 astrotourism.

Dark areas are increasingly important in the fight against light pollution and specific designation schemes have been created, which attract worldwide publicity and interest. These include International Dark Sky Park and Reserve designations overseen by the [International Dark-Sky Association \(IDA\)](#).

In 2020, the North York Moors National Park was designated an International Dark Sky Reserve, along with the Yorkshire Dales National Park. At a combined area of 3,615km<sup>2</sup>, it represents the largest area in the UK and one of the biggest in Europe to be simultaneously designated.

An International Dark Sky Reserve is a designated area of public/private land possessing exceptional or distinguished quality of starry nights and nocturnal environment that is specifically protected for its scientific, natural, educational, cultural, heritage and/or public enjoyment.

[Find out](#) what this means and why it's important.

We're especially proud that of 18 International Dark Sky Reserves in the world, the UK has seven in National Parks and Areas of Outstanding Natural Beauty (AONB)

Brecon  
Beacons

Cranborne  
Chase  
AONB

Exmoor

Moore's  
Reserve in  
the South  
Downs

North York  
Moors

Snowdonia

Yorkshire  
Dales

We're also home to  
two International  
Dark Sky Parks

Northumberland  
National Park and  
Kielder Water &  
Forest Park

Tomintoul  
and Glenlivet in  
the Cairngorms  
National Park

Milky Way over Robin Hood's Bay/Steve Bell



## Economic benefits

Astrotourism's UK roots can be traced back to the North York Moors, with the first StarFest held in Dalby Forest in 2001, and the original Dalby Forest observatories, which opened the same year. StarFest is still running now and is one of the most popular on the UK calendar.

In 2016, the first Dark Skies Festival was hosted by the North York Moors National Park, alongside the Yorkshire Dales National Park. Public enthusiasm, media interest and attendance grows year on year.

In 2020, the first Fringe Festival was organised to help extend the visitor season and 'warm up' for February's main festival. It's now a permanent fixture on the stargazing calendar, hosted every October half term.

Due to restrictions at the time, we hosted the first 'Virtual' Dark Skies Festival in February 2021. There were huge benefits to going online, attracting worldwide audiences and viewing figures into the hundreds of thousands. Although nothing beats witnessing the stars in person, a virtual aspect will feature in future festivals.

Unlike many extremely remote Dark Sky places, accessibility to the North York Moors is one of our strengths, along with a well-developed tourism infrastructure. The area provides ample opportunities for guests to stay longer to attend multiple events, visit different locations and stay and gaze in dark skies friendly accommodation. As well as all the daytime activities!



### 2020 IN NUMBERS

**7,500** event attendees

Almost **£30,000** in ticket sales

Estimated **£250,000** total economic benefit

Cropton Forest/Steve Bell

## IT'S BIG BUSINESS

Northumberland National Park is a well-known and established astrotourism destination, particularly since the opening of Kielder Observatory in 2008. Research by Witton-House Associate/NGI Solutions has calculated dark skies tourism was worth over

**£25 million**

to their local visitor economy in 2018, supporting around

**450 jobs.**

Since the International Dark Sky Park designation in 2013, approximately

**£128 million**

has been generated.



## Marketing opportunities

Such is the quality of the dark skies above the North York Moors and Howardian Hills Area of Outstanding Natural Beauty (AONB), there are a number of key messages you can use in your marketing.

- 💡 We've recently been designated International Dark Sky Reserve status – one of only 18 in the world. Along with the Yorkshire Dales National Park, it represents the largest area in the UK and one of the biggest in Europe to be simultaneously designated
- 💡 An International Dark Sky Reserve is recognised and celebrated for its exceptional dark skies. As such there are measures in place to specifically protect and keep them that way
- 💡 The North York Moors has some of England's darkest areas. Over 92% of the skies fall in the two darkest categories, compared with just 49% in Yorkshire as a whole
- 💡 In the National Park, you can see up to 2,000 stars on a clear night, compared with just a handful in most towns and cities
- 💡 The North York Moors is the driest upland area in the country and our drier air gives excellent clarity for stargazing
- 💡 From almost everywhere in the National Park, you can see the Milky Way with your naked eye. Equipment can open up distant galaxies and sparkling star clusters
- 💡 The North York Moors coastline offers an opportunity for occasional glimpses of the Northern Lights (Aurora Borealis)
- 💡 There's a whole host of fantastic stargazing locations within the National Park
- 💡 Our dark skies are great for nocturnal wildlife like nightjars (April-August), bats, owls and moths
- 💡 The Dark Skies Festival has become a major annual event. The varied event programme guarantees fun for all ages and interests
- 💡 Our Dark Skies friendly network offers exceptional facilities, with advice and information to make the most of a stargazing holiday
- 💡 If you think the North York Moors are magical during the day, just wait until night!

## THERE ARE LOTS OF BENEFITS FOR YOUR BUSINESS



Astrotourism offers huge scope for multi 'day and night' itineraries for people to stay longer, explore, visit, see and do



Stargazing events are plentiful (with potential for more) as there's numerous local activity providers and four Astronomical Societies (Cleveland and Darlington, Scarborough & Ryedale, Whitby & District and York)



The Dark Skies Festival is a great springboard to help you increase business in the off-peak season and raise the profile of the area



You can become part of the Dark Skies friendly network by making small, simple changes to your business.



# How to actively promote dark skies

Stargazing with Hidden Horizons at Dalby Forest/Steve Bell

## Accommodation businesses

Make it easy for them to plan their stay. Provide sample itineraries of what visitors can do over a number of nights and days to help them make the most of their stay and encourage them to stay longer or visit again.

Create itineraries around known activities or celestial events so you can encourage guests to attend multiple events and enjoy some DIY stargazing at your premises. Check out the [dark skies events web page](#) on the National Park's website.

Consider hosting an event with food or accommodation (or both). Hire an astro expert or activity provider to come and guide your guests around the skies.

## Activity providers and food businesses

As a food or activity provider, you can join up with accommodation businesses to create packages with lots of fun puns like See Moor Stars; Stay and Gaze; Graze and Gaze; Ale and Astronomy or Pie at Night.

Get in touch with the Marketing team at North York Moors National Park for event ideas; contact details for astronomy experts; suggestions for business collaborations.

### HOW TO DEAL WITH THE WEATHER

Don't be afraid of the fact that you can't guarantee cloudless skies every time. Most event organisers have contingency plans to keep guests entertained such as a presentation, demonstration, stelarium or planetarium and they're ready to get straight back outside if the skies clear. It's the same for every area and many people for example pay over £40pp to attend a stargazing event at Kielder Observatory with no guarantees.



## On your website

Add keywords to the dark skies area of your website to help with Google search results. Also consider words specific to your business or area. Here are some examples of key words you can use:

star party astrotourism  
night photography **National Park**  
starry skies **dark skies** observatory  
**North York Moors** astronomy  
**dark skies friendly** Howardian Hills  
**milky way** stargazing telescope  
astro photography **stay and gaze**  
aurora borealis **northern lights**

## Social media



Have a go at taking your own images and don't worry if they're not amazing to start with, you can always pick up tips at events from some of our astro photography experts. Steve Bell has kindly provided an e-Book '[Photographing the Night Sky](#)' for North York Moors Tourism Network businesses to download for free. Don't forget you can also make use of the [dark skies image library](#) on the North York Moors Tourism Network.

Look for opportunities to comment and share posts or events from others e.g. Richard Darn, Steve Bell, Astronomical Societies, GoStargazing, North York Moors National Park, Hidden Horizons etc.

Instagram is the best placed platform to use hashtags. Select a few that are appropriate, along with some that are specific to what you do and your location.



Star trails above Helmsley Square/Steve Bell





## Star Count

You can also get behind established initiatives and, as well as contributing to these important surveys, use them in your social media messaging.

For example, CPRE's annual Star Count every February helps them to see where light pollution is a problem and where the darkest skies are.

All you have to do is count the number of stars you can see with the naked eye inside the rectangle formed by Betelgeuse, Bellatrix, Rigel and Saiph (the four main stars in the constellation Orion). Do not include these stars though, just the ones inside the rectangle. There's plenty of advice on how to do this closer to the time on the [CPRE website](#) (or share our own messaging about the initiative).



## Dark Skies Friendly initiative

The North York Moors [Dark Skies Friendly](#) initiative recognises accommodation businesses, activity providers and venues that offer specific activities, facilities or services relating to the enjoyment of dark skies in the National Park and surrounding areas.

Its aim is to champion business collaboration and to collectively promote and raise the profile of the special qualities of our dark skies. We want to encourage businesses to cross-promote each other and take part in activities promoted by the North York Moors National Park.

Once accepted, your business or site will be displayed on the [interactive map](#). You'll also receive a logo to use across your marketing activity.

[Get more information and sign up](#) to become Dark Skies Friendly.

Milky Way above Harome/Steve Bell



# How to protect our dark skies

Light pollution not only makes stargazing more difficult, it has huge impacts on wildlife, alters human sleep patterns and shatters the tranquillity of peaceful areas.



It's important to consider your impact on dark skies and how to improve external lighting on your premises. It's never a case of removing all lighting but using it carefully whilst maintaining safety and security, where and when needed.

Use lights sparingly on motion sensors, angle them downwards (there's no need to light up the night sky) and best of all switch to lower power shielded units which emit a warmer yellow light (3000 kelvin or lower). Carefully chosen LED lighting used only where needed, with timers

and motion sensors, can also dramatically cut energy bills and lower carbon emissions.

We have more information on our [website](#) to help you incorporate dark skies friendly lighting. Including a useful guide from the International Dark-Sky Association to conduct a home audit.

Tell people about the improvements you've made, share images on social, write a blog, include it in a newsletter. It's important to spread the word about reducing light pollution and it shows you care, as individuals and a business.

Aurora over the coast/Steve Bell

## Lighting grant

We're serious about protecting our amazing Dark Skies and are always looking for ideas from communities or collaborating businesses to work together to make a discernible difference by reducing light pollution. Advice and grants are available towards replacement lighting units, installation and even professional lighting scheme designs. Contact [conservation@northyorkmoors.org.uk](mailto:conservation@northyorkmoors.org.uk) if you have any questions or would like to discuss your ideas.

Rawcliffe House Farm



**BEFORE**



**AFTER**



**BEFORE**



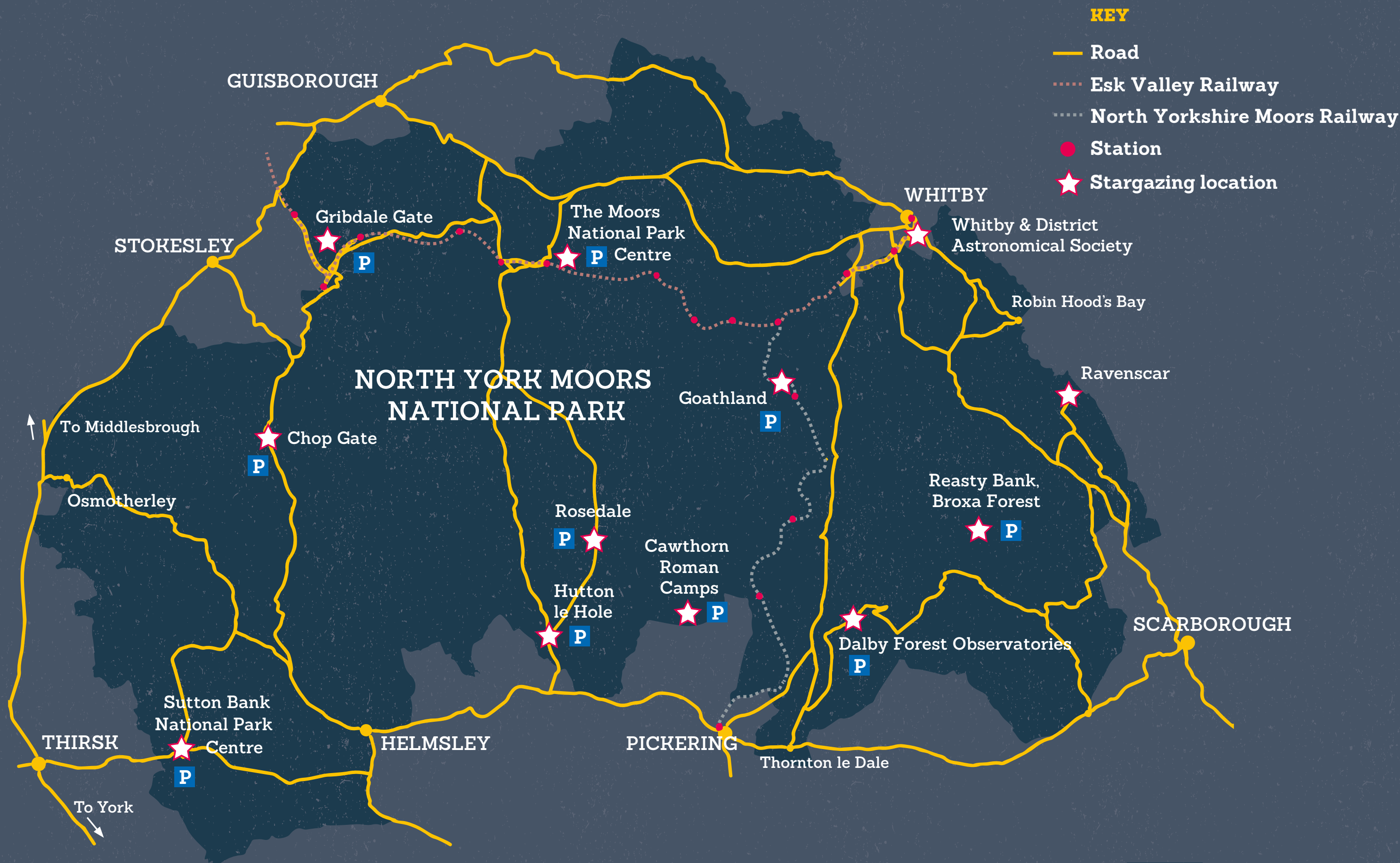
**AFTER**



# Where to go, when to go

Knowing some basic information can really make all the difference. Being able to recommend the best times, places and what to look out for throughout the year is really valuable to your guests. You can better plan your newsletters and promotions to encourage stays around specific events during the year.

Find other great sites for stargazing and places hosting events in the area on the [Go Stargazing website](#).



## When is the best time to observe?

Autumn and winter skies (September to March) - the only obstacles are the weather and the moon. From May to early August, it doesn't get properly dark so you won't see as many stars.



### Autumn

Prime viewing time as the nights are properly dark.

- Milky Way overhead resembling a shimmering river of stars
- Star clusters look fantastic
- Orionids meteor show 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. Wrap up warm and the rewards can be amazing.

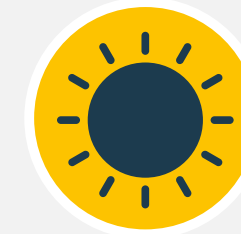
- Glittering star clusters and bright nebula
- Magnificent constellations like Orion
- Geminids meteor shower in December is the year's best



### Spring

Nights are still long and the weather is warming up so it's a great time to observe.

- Good for viewing brighter galaxies and Jupiter is well-placed
- The Plough is high overhead
- The constellation of Leo 'the Lion' dominates the southern sky



### Summer

You'll see fewer stars but truly dark skies return from the middle of August.

- Watch out for ghostly noctilucent (night-shining) clouds high in the sky. They are visible when the sun is below the horizon but the clouds, which are made from icy particles, are still in sunlight
- Watch out for August's Perseid meteor shower - one of the finest annually
- You'll see tantalising glimpses of the Milky Way to whet appetites for the months ahead in northern parts of England



## What to see?

Most of the UK's population lives in 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. The [light pollution map](#) will give you a good idea of how dark your skies are.

Take a look at Go Stargazing's [Dark Sky Calendar](#) for the best times to head out, depending on whether you're moon gazing or stargazing.

### Meteor showers

Meteor showers happen at predictable times throughout the year and are best seen when the moon is absent, which will change from year to year. Look for 'shooting stars', each is caused by a tiny bit of debris left behind by comets and asteroids, which hit the earth's atmosphere at terrific speeds (25,000 to 165,000mph) causing them to vaporise. At their peak, you'll be able to see hundreds of meteors an hour. The darker your location, the more meteors you will see - expect to spot up to two per minute during a storm.

The most impressive showers include: Perseids (August), Orionids (October), Leonids (November) and Geminids (December).

Check out [timeanddate.com](http://timeanddate.com) for specific details about each meteor shower and the next one coming up.

Orionids at Dalby Forest/Tony Marsh

### Northern lights (Aurora Borealis)

The further north you are and the darker your sky, the more chance you have of seeing the magic of Aurora. The displays are caused by energetic particles from the sun interacting with the earth's magnetic field. During intense storms, you'll see pillars of light soaring overhead and the sky tinted red and green above the northern horizon.

The northern lights are certainly visible from the North York Moors, with some good displays seen from the coast in particular. As it is difficult to predict when they'll occur, sign up for alerts, which will give you a few hours' notice.

### Stars and planets

Whether you're hoping to see the rings of Saturn for the first time or get up close and personal with another galaxy, you'll need to know where to look and when.

Updated every Friday, the [Astronomy website](#) provides a weekly update of celestial events near you.

### Andromeda galaxy

This is the furthest object you can see with your naked eye from the North York Moors - an incredible 2.5 million light years away. To the naked eye, it looks like a small faint streak of light below the zigzag shaped constellation of Cassiopeia. Use binoculars and you'll see it's shaped like a rugby ball and fills the field of view. This is another spiral galaxy, similar to our own Milky Way, comprising 300 billion suns and countless planets.

### International Space Station

The ISS is very bright and seen over UK skies at intervals throughout the year. Catch a glimpse by looking on [heavens-above.com](http://heavens-above.com)

### The moon

You'll see the darkest skies when it's the new moon period - two weeks after the full moon. Don't overlook the beauty of the moon itself, especially full moons and supermoons.

Milky Way over Byland Abbey/Steve Bell

### Milky Way

Look directly overhead during autumn and early winter evenings and you'll see this shimmering river of light streaming through the constellations of Cassiopeia and Cygnus. The darker the skies, the more prominent it is to the naked eye. The soft glow is actually caused by the light of millions of dim stars (visible in binoculars) and it's one of the spiral arms of our own galaxy, which we also call the Milky Way.



## Equipment

### Binoculars

Binoculars are the best thing to start out with. These days you don't have to spend a fortune to get a good quality pair. Very easy to use, light-weight and providing a wide field of view, they offer wonderful views of the Milky Way, star clusters, bright galaxies and even the moons of Jupiter!

The best sizes are 10 x 50 or 7 x 50. The first number refers to the magnification, and the second the diameter of the two lenses which collect the light. Larger binoculars will show you more, but they become heavier and are more difficult to use without a tripod.

Good budget options include the Helios Naturesport Plus 10 x 50, the Opticron Adventurer 10 x 50 or the 8 x 40 Olympus Dps-1. You can read up and get lots more advice with [The Binocular Sky](#).

### 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!

Red light torches are a great buy, great for reading star maps and staying safe in the dark. Pick one up online for around £10.

### Apps

#### General night sky viewing

Pocket Universe (Apple)

Sky Map (Android)

#### To spot the Aurora

AuroraWatchUK (Apple)

AuroraWatchUK (Android)

#### Meteor shower predictions

Meteor Shower Calendar (Apple)

Meteor Shower Calendar (Android)

#### International Space Station

ISS Spotter (Apple)

ISS Detector (Android)

### Star maps

If technology isn't your thing, star maps can help to locate brighter stars, constellations and planets. They're produced monthly and are free to download from [Skymaps.com](https://www.skymaps.com).



## Equipment

### What about telescopes?

Should you get one? Well they do give a better view of planets and star clusters but they are more difficult to use. They have a narrower field of view so finding objects can be tough at first until you get the hang of it. If you do opt to buy a scope, keep it simple and portable. Other factors to bear in mind:

- Be sure to avoid very cheap ones – they simply don't work well and are frustrating to use.
- The power of a telescope is not measured by stated claims of 'magnification'. It is determined by aperture – how much light the scope gathers.
- Telescopes are only as good as the mount and tripod you use. Put a good telescope on a shaky mount and it's a recipe for disappointment.
- Buy from a reputable dealer in astronomical products (see next page). Many department store telescopes aren't very good and difficult to use.

### Aperture

**A decent telescope with a 80mm lens is good for a max of about 120x. Bigger scopes offer a higher resolution image at the cost of expense and bulkiness. Everything is a trade off. If in doubt prioritise portability.**

### Good scopes for beginners

The Skywatcher 102 StarTravel refractor (£175) is very usable. Easy to carry, store and transport, it gives nice wide field views of objects like big star clusters and, under dark skies, the Andromeda galaxy.

You can put a telescope on a wide variety of mounts, but by far the best choice is a simple up-down, left-right one called an alt-az. The cheapest option is to buy your telescope with an AZ3 mount (£199). This will do to get you started, but the motions are not the smoothest.

A cheaper alternative telescope on the same mount but of a different design called a reflector, is the Sky-Watcher Explorer-130PS AZ5 Deluxe. It uses a mirror to collect the light, rather than a lens and the eyepiece (which you look through) is located at the top of the tube. At £250, it is very good value and performance is similar to the StarTravel 102, perhaps offering a tad more detail on some objects.

### Something a bit flashier

Try the Skywatcher 127 SynScan (£389). Once set-up correctly, it will slew automatically to objects, but you will need to be able to identify a couple of bright stars to align on. With almost five inches of aperture, it will show you plenty – rings of Saturn, good views of the moon and Jupiter, along with globular and star clusters. Extremely portable, the slight downside is it has a rather narrow field of view.

For more information, further suggestions depending on your telescope needs and general advice, take a look at [Richard Darn's equipment blog](#).

Stargazing with Hidden Horizons at Ravenscar/  
Tony Bartholomew

### 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. Eyepieces are not expensive and shopping second hand is a great way to buy and save.



# Further information

## Useful websites

### [North York Moors National Park](#)

Stargazing locations, dark skies friendly businesses, festivals and events, dark skies friendly lighting advice

### [Go Stargazing](#)

A useful site for advice and event listings year round

### [Stellarium](#)

Interactive planetarium programme. Easy to use and shows the night sky realistically. Free and available for Windows and Mac.

### [Society for Popular Astronomy](#)

Good source of information

### [Clear Outside](#)

Seven day hourly cloud & weather forecasts

### [Commission for Dark Skies](#)

Part of the British Astronomical Association, seeking to reduce the amount of light pollution generated across the UK

### [Cleveland and Darlington Astronomical Society](#)

Organise events and talks at the Planetarium, Wynyard Woodland Park, just outside Stockton

### [Scarborough & Ryedale Astronomical Society](#)

Organise the annual StarFest and public observing events at their observatories, all in Dalby Forest

### [Whitby & District Astronomical Society](#)

Organise Star Parties as well as other events, including at the Bruce Observatory, Whitby School

### [York Astronomical Society](#)

Often run events at Sutton Bank National Park Centre

## Astro retailers

### [Grovers](#)

Northallerton, North Yorkshire

### [Rother Valley Optics](#)

Kiveton, South Yorkshire

### [First Light Optics](#)

Carry a big stock

### [Tring Astronomy](#)

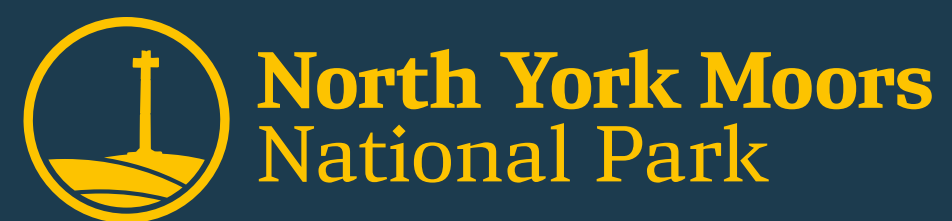
Competitive on price

### [UK Astro Buy and Sell](#)

Well used by astronomers to buy and sell used equipment. Well looked after astronomical equipment can last a lifetime

Rosedale Kilns at night/Tom Mutton





This document has been produced in association with Richard Darn and Hidden Horizons.

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For more information, contact the Marketing team at the North York Moors National Park.

[tourism@northyorkmoors.org.uk](mailto:tourism@northyorkmoors.org.uk)