



Galloway Forest Park Dark Sky podcast transcript

Episode one

Length: 13:27

Speakers: Lucy and Steve

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Lucy: Welcome to the Galloway Forest Dark Sky Park Podcast: a series looking to expand your knowledge about Scotland's dark skies, what to look out for and how to get out and about and explore them this winter. I'm Lucy from Forestry and Land Scotland, and I've come to Glasgow's Science Centre to meet astronomer Steve Owens.

In this episode, we're going to be covering the basics: what to look for and how to find it in the night sky. Your introduction to the galaxy we call home. Hello, Steve. It's great to be here in the planetarium, and what a fantastic resource this is for an introduction to the night sky.

Steve: It's a beautiful place, isn't it? Welcome back, Lucy. It's always great to be in the planetarium. And what a wonderful place for recording podcasts about stargazing in the night sky.

Lucy: So, before we get into the detail, I think it would be really good to go through some of the general things to understand about the night sky before heading out.

Steve: Yes, absolutely. It's always important to understand the basics before you head out because the sky can be, especially in somewhere dark like Galloway Forest, quite overwhelming.

Lucy: Let's start with constellations then. What is a constellation?

Steve: It's a good question. The sky is full of stars and our brains naturally join up the dots and make pictures amongst the stars. People have done that for thousands of years. It's the same

kind of thing that happens when you see shapes in the clouds in the daytime or burned into a piece of toast. Our brains just like to see pictures, even if there are no pictures there.

And for thousands of years, people have joined up the dots at night and seen shapes and broadly speaking, we call those shapes constellations. Every culture in the world had their own set of constellations and star myths. But back in 1930, astronomers grouped together and decided to formalize the map of the night sky. They fixed 88 official constellations, and we'll find a few of those over the course of this recording and will encourage your listeners to head outside and identify them for themselves.

Lucy: Next question then, planets. How do you know that you're looking at a planet and not a star? What's the difference?

Steve: It can be a bit confusing because planets do look more or less like stars. There are five planets you can see without a telescope: Mercury, Venus, Mars, Jupiter and Saturn. Some of those can be really bright, especially Venus and Jupiter. They can be brighter than anything else in the sky, apart from the moon, and that means people can see them really easily.

And when you look at a planet, the main thing that differentiates it from a star is that planets don't twinkle. Stars twinkle, not because the stars themselves are twinkling, stars shine with usually a very steady light. But in the last fraction of a second of that starlight's journey, just before it goes into your eyeball, it's got to move through the air above your head, and that causes the starlight to get bounced around. If the air is especially turbulent, if there are warm air currents above you, the starlight can bounce about. And that makes it look like the stars are twinkling.

Planets are closer to us. They are reflecting sunlight that we can see, and that light is coming to us in a much thicker beam, a much steadier beam. It doesn't get bounced around by the air above us. So, planets for that reason shine in a very steady light, they don't twinkle.

Lucy: And one of the fantastic things to see in the night sky is a meteor shower. Are there good times of the year to see those? And what exactly is a meteor shower?

Steve: Yes, and Galloway Forest Dark Sky Park is one of the very best places in Europe to see meteor showers. We call the things that make up a meteor shower, shooting stars. People might have heard them called that before. The name's are a misnomer. They're not actually stars at all, they're tiny little bits of grit, bits of space dust, burning up in our atmosphere.

And if you go stargazing on any night, especially somewhere really dark like Galloway Forest, you can expect to see one or two every hour. They aren't that uncommon. The reason people think meteors and shooting stars are rare is because we don't spend much time looking up at night and those of us who do tend to live in or near big towns and cities.

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So, on a standard night, you see plenty of shooting stars, plenty of meteors. But there are certain dates in the calendar, certain nights every year, where the rate of meteors dramatically increases. We call those meteor showers. And that happens because as the earth orbits around the sun, sometimes it passes through a big cloud of space dust left behind by a comet.

And that means lots and lots of bits of grit, bits of debris are passing through our atmosphere at once, causing lots of meteors. The very best meteor showers, you can see perhaps one shooting star every minute for hours and hours on end. Those are quite rare. They happen at very specific times of the year. The very best meteor showers to look out for, especially in the winter season, are meteor showers called the Geminids meteor shower in December and then in early January, the Quadrantids.

But the Geminids really is one of the very best of the year. Happens every year at the same time in mid-December. And if you've got good dark skies, you'll be amazed by what you can see.

Lucy: So, before you head out and look for constellations and planets, it's good to have a point to start. And the North Star would be that good point to start from?

Steve: You're absolutely right. You know your stuff about stargazing. It can be quite overwhelming stepping outside in a perfectly dark place like Galloway Forest, the sky is littered with thousands and thousands of stars. Compared to city skies or skies around big towns and cities, there's an overwhelming number of stars there. So, getting your bearings is really important. And one of the very first things that I always look for whenever I'm stargazing, no matter where I am, is the North Star.

The North Star is a very easy thing to find if you know where to look and it helps you get your bearings. If you can stand facing the North Star, you'll be facing North. Now, the North Star is quite famous, one of the most famous stars at night. People think it's famous because it's bright. It isn't actually that bright. It's only the 46th brightest star in the night sky, which means you can't just look around and expect to find it easily. You've got to use a signpost to point towards it. And that signpost is itself made of stars. A pattern of stars we call the Plough.

Now, the Plough isn't officially a constellation. It's part of a bigger constellation called Ursa Major, the Big Bear. But the Plough is made up of seven stars, three in a curve and four in a kind of lopsided rectangle. Looks a lot like a saucepan. In fact, in France they call it La Casserole, the Saucepan. And the two stars furthest from the handle of the Plough point in a straight line to the North Star.

So, that's how you find it. Why is it important? Well, if you find it and stand facing it, you'll be facing north. And if your star map tells you the planet you want to see is in the southwest, you can use the North Star to work out what direction you should be looking for that planet or that constellation.

Lucy: And is there anything else to know before heading out in terms of features in the night sky?

Steve: There's a lot of things to see and it can be quite overwhelming. There are lots of apps that help guide you through the night sky. You can download those and look at them before you go. I'd always encourage you to not look at your phones when you're stargazing. To keep your dark vision, you want to make sure that your eyes dark adapt as much as possible.

In fact, if you drive into Galloway Forest at night with the headlights on and then step out of the car, your eyes won't be used to seeing in the dark. You've got to wait for maybe ten or 15 minutes for your eyes to properly adapt. And any amount of bright light from a tablet or from a phone can spoil that process.

So, keep your phones and tablets away. Let your eyes just soak in as much as possible. You don't need binoculars or a telescope. Binoculars are great for stargazing, but just your eyes will do. Try and fill your eyes with as much sky as possible. Put your back to any local lights. If there's a car in the distance, turn away so it doesn't dazzle you.

And the other really important thing is to be safe because it's really sometimes cold in the winter. You want to make sure you're wrapped up warm. You want to make sure you've got some kind of light source in emergencies. Astronomers often use a red torch, that protects your night vision a little bit. You can buy red torches, but you can easily make one just with a normal white torch and you put a rubber band around it with a little bit of sweetie wrapper or any kind of red cellophane, it will cut out the dazzling white light.

Lucy: Okay, so we've covered constellations, planets, and meteor showers. Is there anything else, Steve, that people should look out for in the night sky?

Steve: Yeah, there's a really big thing, the thing that people go to dark places like Galloway Forest Park for, and that is the Milky Way. The Milky Way is on most stargazers' bucket lists and most people don't get to see it. 90% of the population of the world can't see the Milky Way because if there's any amount of light pollution in your sky from streetlights or football stadiums or motorways nearby, then your sky's too bright. The Milky Way gets drowned out by that light pollution.

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But if you're somewhere really, really dark, the Milky Way looks absolutely spectacular. Some of the best views I've ever had of the Milky Way have been from right at the heart of Galloway Forest Dark Sky Park. And the Milky Way is our home in space. It's a galaxy.

A galaxy is just a big collection of stars. All the stars you see at night and the star we see in the daytime, we call it the sun, they all exist inside our galaxy. In fact, everything you see in the night sky exists inside our galaxy, the Milky Way. Except one thing, we'll come onto that in a moment. But it's our home in space.

It's like a celestial city full of stars. There are hundreds of billions of stars in the Milky Way. Most of them are too far away to make out as little dots. We can just see the nearby ones as dots at night. But because there are billions of stars in our galaxy, the light gets blended together and it forms a beautiful silvery gray archway of light across the sky.

And it is a breathtaking sight to see. And it's something that is really rare in the modern world. To see it, you've got to make a real effort to head somewhere really dark and luckily Galloway Forest Dark Sky Park is one of the very best places to do that.

I mentioned that everything you see is inside the Milky Way except one thing. And that thing is the Andromeda Galaxy, which is really a really special object to look for. It is very faint. It is not especially spectacular unless you know what it is you're looking for. And we'll talk about the Andromeda Galaxy and how to find it when we're covering what things are visible at what months.

Lucy: So, now I think it would be good to look a little bit more into detail, Steve, about the winter season, this winter season 2023/2024, and understand perhaps what times are best to go stargazing through the season.

Steve: Yeah, it's really important to understand that if you didn't plan your stargazing trip and you just wandered randomly into Galloway Forest Park, it might not be dark enough to see the Milky Way. It might not be the right time of night or the right time of the month to be able to see these things because the night sky has its own rhythm.

And as the earth orbits around the sun, we can see the sun rising and setting at different times each night. It's really obvious that the sun is in the sky much longer in the summer than it is in the winter. We get short, dark, cold days in winter and longer, theoretically warmer days in the summer. So, when you're stargazing in winter, you want to make sure you're out long after sunset, once all the twilight is gone from the sky.

It's not enough just to go out at sunset because the sky is still bright for about 45 minutes after the sun goes down. In fact, astronomically speaking, there's light in the sky from the sun for about 2 hours after the sun goes down. You've got to wait for quite a long time.

And as the year goes on, the times to go stargazing each night will vary. But broadly speaking, in October and March, at the start and end of the season, you want to wait until around about 8.30pm at night to get a proper pitch-black sky. In the middle of the season around December/January time, you're talking about 6pm at night or 6.30pm at night to wait until the sky is properly dark. The best place to find that is online. You can find sunrise and sunset times and then add a couple of hours on after that, and that's the time to head out stargazing to it's the sky looking at its darkest.

But then something else gets in the way, which is the moon. The moon is a beautiful thing to observe, especially a full moon is a beautiful sight to see, but it kind of gets in the way of dark sky stargazing, which is really what we're focused on here. And as amazing as it is to wander through Galloway Forest Park on a moonlit night, if you want to see things like the Milky Way or lots of shooting stars or faint planets or galaxies in the sky, you really want to make sure the moon isn't up and certainly not full when you're doing that

And the moon goes through phases once every month or so. In fact, the word "month" comes from the word moon. That's why you call it a month, it really should be pronounced moonth, but that's a bit of a mouthful. So, the moon goes through phases once a month roughly, and that means that there's a pattern. We can predict when the best time to go stargazing is going to be. And for this coming winter season 2023/2024, really, you're looking at going out in the middle of the month.

The second or the third week of each month is around about the time of what we call a new moon: when the moon isn't in the sky or if it is, it will be a thin crescent. You really want to avoid the later part of the month when the moon becomes full. And that is true all the way from October 2023 through to March 2024

Lucy: A big thanks to Steve and the team at Glasgow Science Centre for creating this series with us. Tune in to our next episode as we talk about this year's observing season, October 2023 to March 2024, and what to look for each month in the night sky above the Galloway Forest Dark Sky Park. To learn more or to plan your visit, visit our website first: forestryandland.gov.scot