

# Tales from Scotland: The Value of a Dark Sky Site

By Phil Hart

During my five years in Scotland, I learnt some lessons about the value of the facilities available to ASV members.

When I first arrived in Scotland in August 2001, one of the first things I did was look up the local astronomical society to find some new friends. It's fair to say that Scottish astronomers are 'clear sky challenged' and noting that Aberdeen in north-east Scotland fared better than the west coast in this regard is not saying much at all. At least Aberdeen was a small city so thirty minute week night drives to find dark skies were possible, especially when the sun set at 3pm in winter!

What I did learn in those early days is that hunting aurorae is a big part of amateur astronomy in Scotland. But despite a geographic latitude of 57 degrees north, Aberdeen's magnetic latitude is only the same as southern Tasmania, so aurorae are certainly not common. And once you wipe out four months of the year when it doesn't get astronomically dark, throw in a lunar cycle and perhaps one clear night in seven, common becomes an even greater misnomer.

Still, for much of the dark winter months, we followed the auroral weather as closely as the terrestrial variety. In the days following a solar storm, we would have bags and cameras packed and ready to go, waiting for the signal that the storm had arrived and was battering Earth's magnetic field. Other times I would refuse a pint in the pub on the basis that I was 'on call', waiting optimistically for an automatic text message from a network of VHF radio operators who could detect auroral activity.

Responding to such an alert one night, I ended up on a back country road north-west of Aberdeen. All such roads were narrow, but I found a spot with a good view to the north and parked my rusty old Audi 80 completely off the road out of harm's way.

I was squeezing a few photos in between clouds and the occasional passing headlight, when a police car came zooming along the road and came to a sharp stop in front my

car. As the officer walked towards me in the dark, I started to say "it's ok, I'm just watching the aurora" but he quickly interjected with a gruff response of "Well turn your lights on then!" I was about to point out the problem with his suggestion and try to direct his eyes towards the aurora, but he simply jumped back in the car and sped off again. He had probably never even seen an aurora, which is true for most of the locals, despite a traditional song titled "The Northern Lights of Old Aberdeen", which presumably dates from much older and darker days.

On another occasion, we had arranged an early morning Leonid meteor observing session in a back yard out of town, only for the odds stacked against us to play out again and have the show largely clouded out. On the way home, short of sleep and with a tight timetable ahead for a particularly big day at work, the skies cleared and I saw a Leonid through the car windscreen. I pulled off the road into a driveway leading into a paddock, away from the road but in clear view of anybody passing by.

I was ready to enjoy a few exquisite moments of meteor watching and may even have been preparing the camera when a police car pulled in beside me. I was about to explain again that everything was normal except for the meteors overhead, but they decided to assume I was a car thief and wanted me to sit in the back of their car while they ran checks on my license and the car. I thought about explaining that if I was a car thief the last thing I would do would be to stop my car on a wide open road in full view of the early morning traffic. I also wanted to suggest two of us could stand outside and watch the sky while leaving the colleague in the car to complete the checks. Neither approach appeared to have much chance of success.

By the time they finished and politely thanked me for my cooperation, I had no choice but to quickly pack up and finish the drive home, safe in the knowledge that my tax dollars were being well spent preventing car theft. Events like these prompted me to begin a systematic search for a dark sky site away from the prying eyes

of police officers and other strange people out on the roads at night.

I got as far as agreeing with a couple of farm owners that I could use their fields, before another new enterprising member of the Aberdeen Astronomical Society, Torcuill Torrance, suggested we try Forestry Commission land. That idea hadn't occurred to me given restrictions on access at home in Oz, but the Scots are ahead of us in this respect, requiring these agencies to facilitate public access to their land.

We found a perfect spot on the edge of a pine plantation 30 minutes west of Aberdeen, at the end of a forestry track with a clear view to a distant southern horizon and trees for shelter from the cold westerly wind and to nicely frame aurora photos in the north.

The biggest issue was sorting out insurance to cover loss of the plantation through fire. It seemed to me that anybody who could actually start a fire in a damp Scottish pine forest deserved a reward and so I felt it a little odd that we needed insurance in case we should achieve this feat by accident. However, the details were eventually resolved and the observational activities of the local society increased as we all enjoyed the camaraderie of observing together.

It also meant that following an aurora alert, we could all head for the same spot and share tea and cherry scones while debating if it had been a prank alert or whether there really was an auroral storm going on 50km above the clouds tops. To be fair, Scottish weather came good at the best possible time. Two of the biggest solar flares on record occurred around successive new moons in late 2003, and we were treated to spectacular auroral displays. All this shortly after I had bought my first digital SLR.

Like many astronomical phenomena, aurorae are completely different to visual and photographic observers. While photographs record amazing colour only rarely visible to the eye, their dynamic visual nature is spell binding. An auroral display would often start as a faint band low on the

northern horizon, and if activity picked up, vertical rays would develop which would move sideways and change in brightness. As the auroral oval around the globe moved further away from the poles at times of heightened activity, the whole show would move further up in the sky, and it became more like a curtain of light waving and billowing in the wind. What previously looked like isolated bright vertical rays could be seen to be folds in the curtain, where the extra light in the same vertical plane stands out from the otherwise thin curtain.

On that first storm night of October 29, 2003, as the aurora grew higher above the northern horizon, the brightness would rapidly flicker across the whole display, something like reflected firelight flickering across ripples on water. Eventually the show moved overhead, with the apparently diverging rays coming down around us creating a dramatic yet rather spooky corona overhead. While the structure of the corona changed slowly, the brightness continued to flicker like firelight, an effect which static photos could never convey. If I were a prehistoric cave dweller having to explain this to my children, I'd be making up some pretty fanciful stories too! Eventually, after many hours of adrenalin packed observing and photographing, the show subsided and we each returned home, amazed and addicted.

Just a few weeks later, at 5:20pm on the second storm night of November 20, I hadn't even left the city lights and there was still twilight in the sky when I could already see a notably red auroral band on the western horizon through the car windscreen. A loud expletive followed and I tried to concentrate on the drive to our beloved dark sky site. Not long after arrival it seemed that our carefully selected site had photo framing trees on the wrong side – this aurora had already moved to the bare southern horizon and ultimately was seen from as far south as the Mediterranean (and as far north as Melbourne!). The bright red of the rays and the corona was the distinguishing feature of this display. It's hard to keep quiet observing such events, and equally hard to know where to look. While concentrating on one part of the sky, somebody else would exclaim about the new ray brightening in another direction.

Those two nights of aurora storms, and many other quieter nights shared with astronomy friends at the

forest site, are some of my favourite memories of five years in Scotland. That says a lot about the value of astronomical societies and of locations to share observing nights.

Since moving back home to Melbourne in mid 2006, I've spent nearly twenty nights at the ASV's very own dark sky site north of Heathcote in central Victoria, which was purchased by the Society in 1988 with the help of a major donation from Leon Mow.

For not much more than the cost of a couple of nights at a camping ground, in addition to all the other benefits (including the newsletter in your hands now), your ASV membership buys you unlimited access to this well established dark sky site. My colleagues in Aberdeen would be amazed by 36 acres of private land, sixteen bunk beds, places to pitch a tent, flushing toilets, hot showers, gas stoves and power points! It's not quite five star accommodation, but you'll see plenty more than that in the sky.

*Aurora over Scotland; Photo by Phil Hart in late 2003*

And at any dark sky weekend you'll find new astronomical friends who will happily show off their telescope or provide advice if you're thinking about buying or building one yourself. A few paces north of the observers, in a little field of their own, you'll find a collection of astrophotographers enjoying long cold nights recording the night sky on all kinds of cameras, and who will also be happy to teach you the tricks of their trade.

Having not been harassed by police even once in all my visits to the Leon Mow Dark Sky Site, I am very grateful to those ASV members who have donated their time and money to make this site what it is today. If you haven't already, you should make a visit to meet new people and see the stars you've been missing out on.

[Editor's Note]

Readers interested in Phil's photos of the Northern Lights should look up the following website:

<http://philhart.com/gallery/Astrophotography/>

