

## Photographing Weather and Atmospheric Optics Summary Notes by Mary McIntyre

### Photographing Clouds

- Interesting cloud formations can be easily photographed with a mobile phone. Look for cloudbursts or sunlit rain falling on days with sunshine and showers. During stormy weather we sometimes get beautiful bobbly mammatus clouds, created by wind sculpting. Also look for the classic anvil-shaped clouds that are seen during storms.
- Be aware of any forecasts for severe weather and make sure you're safe from strong wind gusts and potential thunderstorms, funnel clouds or tornados.

### Photographing Rainbows and Atmospheric Optics

- Rainbows always appear on the opposite side of the sky from the Sun. They are caused by a mixture of refraction and reflection that causes the sunlight to be deviated by around 42 degrees; this results in colour dispersion. A rainbow is a cone of light and the outer edges of the bow form a full circle with a diameter of 84 degrees, with the anti-solar point at its centre. The higher the Sun is, the lower a rainbow will be, until the Sun exceeds 42 degrees when the rainbow is then below ground. When the Sun is very low in the sky we see half of the circle but if you're in a tall building or have a drone, you can see the full circle. Phone cameras are a great option because they have a wide angled lens and also have a built-in panorama function. If shooting with a DSLR, a polarising filter helps to bring out the colours. A good starting point for settings would be around ISO-800 and a fairly fast shutter speed but use your live-view screen to gauge how long an exposure you need.
- Solar rays are a frequent sight in the UK, with clouds creating alternating bands of light and shade with the rays fanning out from the Sun. Sometimes they stretch all the way across the sky and converge again at the anti-solar point. Anticrepuscular rays are often seen with fragments of rainbows. Again, phone cameras are great for photographing rays.
- Coronas / iridescent clouds are caused by sunlight being diffracted by tiny, super-cooled water droplets in lower level clouds. Being very close to the Sun I don't recommend using a DSLR to photograph them – hold your phone up and try to reduce the exposure near the Sun so the centre isn't too over-exposed. The bit around the over-exposed part will easily show the beautiful colours
- Iridescence in aircraft vapour trails can occur when water condenses out over the wings of an aircraft and leaves a misty trail above the usual exhaust trail. When the angles are right these droplets diffract sunlight and will produce a spectacular colour spectrum tailing the aircraft or over the aircraft body. This is best photographed with a 300mm zoom lens so make sure you cannot accidentally point your camera at the Sun, because it will permanently damage your eyes.

- Ice haloes, sundogs and arcs are far more frequent than rainbows. They are caused by sunlight being refracted by ice crystals in high level clouds. The most commonly seen are 22 degree halos (which have a diameter of 44 degrees) and sundogs (parhelia or mock suns), and both will always have the Sun in the middle. Phones do a decent job of capturing these, but best results are with a DSLR + 10mm wide angled lens. I use ISO-100, f/22 and a fast shutter speed. It's best to photograph them in RAW because then you can process the images using a specialist colour subtraction routine which brings out fainter arcs that aren't obvious in your photos. Instructions are here (scroll down to see the English translated version): <http://opticsaround.blogspot.com/2013/03/le-traitement-bleu-moins-rouge-blue.html>
- All atmospheric optics seen around the Sun have a lunar equivalent but they are much fainter because the Moon is much fainter than the Sun. A bright lunar corona, 22 degree halo or moondogs can be easily captured with a phone camera, but if you use a DSLR + 10mm wide angled lens, my settings are ISO-1600, f/4.5 and between 3 and 6 seconds.
- To help identify atmospheric optics, visit: <https://www.atoptics.org.uk/>

#### **Space Weather – Aurora Borealis or Northern Lights:**

- Faint aurora displays happen quite often from the middle and south of the UK but they're even more frequent further north.
- Download an aurora notifier app for your phone I use the Glendale App which you can get from their website here: <https://aurora-alerts.uk/>  
You can also monitor [www.spaceweather.com](http://www.spaceweather.com)
- Usually, aurora from mid-latitude is low along the northern horizon, so my advice is to point your camera north, but during a more active display aurora can be anywhere in the sky, so look overhead or in the south. Shoot around ISO-800 or 1600 for between 5 and 20 seconds depending how bright the aurora is or how much moonlight interference there is. Remember that aurora is moving so longer exposures will result in blurred pillars. Review your shots to check exposure level, then shoot on continuous.
- Leave your camera and let eyes become dark adapted so you can see the faint aurora as well as shooting it. To the naked eye aurora from mid-latitude usually has very little colour so don't expect to see dayglow fireworks (even though we did get that twice in 2024!)
- Creating a timelapse video will show movement of the aurora and can confirm whether you've got aurora or light pollution in your photo.
- Modern mobile phone cameras can easily pick up aurora displays.

Mary McIntyre

My atmospheric optics highlights gallery is here:

[https://www.flickr.com/photos/spicey\\_spiney/albums/72157713848313261/](https://www.flickr.com/photos/spicey_spiney/albums/72157713848313261/)

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