

When is the best time to observe the Northern Lights?

It must be dark of course. Therefore, in the northern hemisphere winter time with its long nights gives a higher possibility to see auroras. However, strong solar eruptions also occur in the summer months.

The moon, on the other hand, is not an obstacle - even with a full moon auroras can be observed. For the photographer the moonlight offers the advantage, that snowy landscapes, trees, buildings etc. are visible and you see the proportions on your pictures. With a little luck, the moon rises a few days later after midnight. Then during auroras in the early evening the mood is completely different and the snow has a green cast.

How should you plan a Northern Light-trip?

The sun rotates in about 25 to 31 days on its axis - at the equator, the rotational speed is faster than at the poles. On this "Carrington Rotation" the long-term aurora forecast is based: it is believed that sunspots remain active and lead after 27 days to auroras again. Ideal for a trip is a period of one to two weeks. So choose a time, where many activities may be possible (from last rotation).

The 3days short-term forecast should offer better precision, but from my experience it do not.

<http://www.swpc.noaa.gov/products/27-day-outlook-107-cm-radio-flux-and-geomagnetic-indices>

<http://www.swpc.noaa.gov/products/3-day-forecast>

When you should leave your room?

Basically as soon as it gets dark outside and there is no heavy snowfall or a completely cloudy sky. If you have an internet connection, you can watch the values of a magnetometer station. For Northern Europe Kiruna is a good choice:

<http://www.irf.se//Observatory/?link=Magnetometers>

However, there is a time delay until the data is updated.

Another option are the ACE satellites in the L1 point with measurements of different solar wind parameters, Northern Lights may start 15 to 60 minutes after the satellites detect a CME impact.

How your eyes see an aurora?

Frequently an aurora begins as a horizontal band at the horizon, after a while it may develop a swirl. Such an aurora appears at the beginning as a pale gray cloud for your eyes, on pictures - by the long exposure time - the green color is already visible. With increasing Intensity also the eyes see the aurora as green appearance.

During other nights the aurora forms filigree green stripes. Like a curtain which moves in the wind - clearly visible to the eye. On pictures you can see above the green part also red-violet stripes. Purple auroras are rarely seen with the eye.

Which camera is useful?

The autofocus does not work in the dark neither that exposure automatic does. So:

- Deactivate the autofocus of your camera
- Deactivate the built-in flash of your camera
- Choose manual exposure program
- Choose RAW format (if it is possible).

Some of these requirements are not available in compact cameras. System cameras lenses ($\mu 4/3$ from Olympus or Panasonic) have often a focusing ring that works as an electronic rocker and can also not be used for such night shots. The most suitable type of camera is still the dSLR.

To prepare the camera for the night, focus before dawn on a building that is between 15 to 30 meters apart. Then disable the AF and fix the distance ring on the lens with adhesive tape to avoid accidentally changing this setting. If you are interested in more information, search on the internet for the keyword "hyperfocal distance".

Take with you enough memory cards with large capacity. Or do you want to change card during aurora? Take a lot of pictures, better one too much than one too little!

What kind of lenses are suitable?

I used both a fisheye lens (10 mm focal length) as fixed focal length / zoom lenses of 12-30 mm focal length. Camera was a dSLR with APS-C sensor. The lenses should be as fast as possible: F4.0 ist ok, F2.8 is better.

Which exposure times are useful?

The shorter, the better! The upper limit should be 30 seconds. Only auroras that change very slowly still give you contours on your picture. Exposure times of 5 to 10 seconds are better, then the stars are visible as dots.

Before departure, you should try at home during a clear night with visible stars how good your camera is at high sensitivities and how good your RAW converter keeps the noise under control. With current APS-C cameras sensitivity of ISO 1600 to ISO 3200 should not be a problem. My advice: the program DxO with built-in PRIME-noise reduction gives good results.

Which tripod is useful?

With exposure times of a few seconds a tripod is mandatory. It should be stable (as a rock) - mention you will have puffs of wind, that will ruin some of your pictures. For crusted snow use short spikes, in powdersnow long spikes with snowshoe plates, so the tripod will not disappear in the snow.

Cable release? At -20 degrees, the cables getting hard / brittle and break easily (take spare!). Infrared trigger? Good idea, but they have only a small coin battery inside, whose capacity is exhausted quickly in cold weather.

A hook on the bottom of the center column is handy to attach a weight (eg filled bag). However, it should hang direct above the ground, so the wind can't let your tripod vibrate.