Chasing Aurora Borealis

> In America "storm-chasers" are the intrepid types who pursue tornadoes, and sometimes hurricanes. But the Arctic Circle has its aurora chasers - people who speed around in search of the best views of the aurora borealis, or Northern Lights.

Last week we saw one that had everything - spiralling, curtains, ribbons, greens and reds, and the whole sky lit up. We were amazed at what was unfolding before us," says Andy Keen.

Five years ago he left his job running a charity in the UK to move to Ivalo, a remote village in northern Lapland, Finland, latitude 68 degrees - two degrees above the Arctic Circle."I saw a TV documentary about the Northern Lights. So I went there to have a look. Now I'm absolutely addicted," he says.Mr Keen's company, Aurorahunters, now takes seven tourists a week on hunting trips in the Arctic wilderness to search for the Northern Lights.

"The reason I chose here is because the population is very low, there's very little light or noise pollution, and it's perfect hunting territory for the aurora," he says.There are similar companies operating elsewhere in Finland and in neighbouring Norway where the official tourism website describes the aurora as "a tricky lady". It adds: "You never know when she bothers to turn up. This diva keeps you waiting."But aurora chasers like Mr Keen are impatient - they go after the diva instead of waiting for her to come to them.That means studying charts to find clear skies. "We look at all the weather data," he says. "We're checking the cloudiness reports. Looking at the cloud movement, the density of the clouds. We're pinpointing a place we feel at that particular time there will be a hole in the cloud.

"When a location has been selected, Mr Keen and his group jump into minibuses and head into the wilderness, sometimes taking to sledges pulled by huskies to reach the most remote areas. They often see moose and bear tracks and have ventured as far north as the Arctic Ocean.

All to get the best vantage point to see the aurora borealis, named after the Roman goddess of dawn (Aurora) and the Greek name for the north wind (Boreas).

However, it's the solar wind, not the north wind, that is the determining factor. Sunspots"The process that causes the auroras is similar to the physics of a neon sign," says Joseph M Kunches, Space Scientist at America's Space Weather Prediction Center, part of the National Oceanic and Atmospheric Association (NOAA)“Aurora borealis (Martti Rikkonen)For many Finns it's nothing special - but when they are good, everyone is interested because there is so much colour”Martti Rikkonen (and his prize-winning photo)"

That is, an electron interacts with neutral atoms and causes light of various colours to be emitted. What happens when the aurora brightens is particles that start at the sun - and most of these are electrons - are brought by solar winds towards the Earth and guided by the Earth's magnetic poles."When the particles interact with the Earth's atmosphere, they excite molecules already there, and they emit light."The colour of that light is dependent upon which gases in the Earth's atmosphere - oxygen, nitrogen, or some other - are being excited. And when the solar winds are stronger and more 'gusty', the auroras will be more brilliant."The strength of the solar wind increases or decreases in line with the number of sunspots, and it goes in cycles. Aurora hunters are in for a treat in the coming few years, according to Mr Kunches. "Solar activity tends to increase rapidly every 11 years or so. According to our predictions, we are about to enter in 2012 and 2013 a new wave of heightened activity. That translates to more frequent auroras," he says.