

Northern Lights season begins

There is no denying that witnessing a good display of northern lights can be a spiritual experience. The first time I saw aurora borealis, I was a teenager visiting my father who was on a long term work assignment in the town of Hay River, North West Territories. I recall thinking that the display looked as if a shimmering blanket of light was being pulled across the night sky. My mother, on the other hand, was convinced that when she lifted her hands upwards, 'aliens' were swooping down towards her to abduct her! There is a rich assortment of folklore associated with aurora from people all across the globe. In Norse mythology, there is mention of 'bifrost', which describes a burning bridge extending between Heaven and Earth that the Gods could travel on like a superhighway. Inu stories explain aurora to be spirits of deceased children playing with the head of a walrus, and that whistling during an auroral display would beckon the lights to come closer, while clapping would cause them to disperse.

Aurora borealis are caused by high-energy charged particles known as ions that are ejected from the Sun during periods of solar flaring. Periods of solar flaring and sunspot activity will usually precede northern lights by a couple of days or so. During a solar flare event, a steady stream of energetically charged particles is emitted from the Sun that creates what is known as 'solar wind'. When this solar wind approaches Earth, it is deflected around our planet by the Earth's magnetic field. There are further interactions with the magnetosphere that direct the particles towards the north and south poles. Hence the 'boreal' in aurora borealis, which means 'northern' in Latin; 'aurora' is Latin for dawn. The aurora that occurs near the south pole is called aurora australis.

Northern lights are best observed during the night hours of October to February. They occur during the summertime as well, but often go unnoticed due to the late hour of darkness when most people are asleep! Like many other astronomy viewing activities, it helps immensely to be away from the glare of city lights to observe aurora. Many auroral displays will occur just above the horizon and can be washed out by the light pollution of urban centres. Aurora can be observed with some regularity from southern Alberta, although impressive displays from the Lethbridge region are somewhat rare. Other more northern cities such as Edmonton and Saskatoon receive so much aurora that amateur astronomers in those cities complain about it - saying that the northern lights interfere with their telescopic viewing of deep sky objects - rather than enjoying the beauty from the colourful show.

In some years there are more frequent and intense displays of aurora, associated with the 11 year sunspot cycle. During those years there may be more solar flaring activity and more opportunities for impressive displays. To get a northern lights forecast, there are a number of websites that give a prediction about upcoming nights (see <http://www.spaceweather.com> or <http://www.gi.alaska.edu/cgi-bin/predict.cgi>). There is quite a bit of research being conducted about some of the mechanisms that cause aurora, including solar flares and the earth's geo-magnetic field. Martin Connors, a researcher and associate professor at Athabasca University, has been studying the interactions between solar winds and the earth's geo-magnetic field for a number of years and recently gave a presentation to the Lethbridge Astronomy Society about his work. According to Connors, there are a surprising number of effects that can be felt on Earth by 'space weather'. During an intense auroral display fueled by solar winds, a huge amount of energy is generated that can interfere with power transmission lines and even damage satellite communications.

By Trevor Helwig for the Sun Times

Byline: Trevor Helwig is a member of the Lethbridge Astronomy Society, which holds its next regular monthly meeting on Friday October 28th at 7:30 PM at the Popson Park Oldman River Observatory. See <http://www.lethbridgeastronomysociety.ca/> for more details



PHOTO COURTESY DANNY PONOMAR

An auroral display taken this past August at Cypress Hills, Saskatchewan. The Northern Lights can be seen from southern Alberta but are not always visible from urban centres.