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## ECLIPSE: August 21, 2017

Ken Tapping, 15<sup>th</sup> August, 2017

To see the Moon entirely cover the solar disc on the 21<sup>st</sup>, you will need to be exactly in line with the Sun and Moon. This will happen on a track passing across the USA. In Canada we are well off that track, so we will see the Moon cover part of the Sun. Since the track follows a line crossing the US from northwest to southeast, Western Canada will be closer to the track than the eastern half of the country, and will see more of the Sun covered. Regardless of your location, the event will be worth checking out.

Staring at the Sun is dangerous. However, evolution has programmed into us some special eye protection measures. On sunny days we instinctively avoid looking at the Sun. If the Sun is in the direction we have to look, our eyes keep moving so that the tiny solar image does not stay at the same place on the back of our eyes for very long. However, curiosity can drive us to override nature's protective measures. Solar eclipses make the Sun unusually interesting, and we are tempted to make the dangerous mistake of staring at it.

When you look at the Sun, the lens in your eyeball acts as a burning glass, and the target is the back of your eye, where imaging happens. You can also damage the protein jelly, or "aqueous humour" that fills your eyeball. The damage can be permanent. Staring at the Sun using a telescope or binoculars that have not been modified for solar observing could likewise lead to permanent damage.. A pair of 10x50 binoculars (10 times magnification, 50mm objective lenses), will collect between 50 and 100 times the amount of light and heat that your eye lens will collect. Permanent damage will be near instantaneous. There is specialist hardware that can be used with telescopes and binoculars that make them usable for safe solar observing. However, unless you are completely familiar with these devices and how to use them...DON'T. If you are not an expert then go find one.

Special protective sunglasses are being sold for safe eclipse viewing. They are one of the easiest

methods for safe observing. However, they have to have the right, certified filter material. Deal with a local science store or local astronomy club.

On the day of the eclipse, the event will start with the appearance of a tiny round nibble out of one edge of the solar disc. This is the edge of the Moon as it moves in front of the Sun. Gradually the bitten-out bit will get larger. In the US, on the "line of totality", the coverage will increase until the Sun is totally covered by the Moon. For us in Canada, the Moon will cover a good fraction of the disc, giving us a "Crescent Sun". Then the Moon will move on, progressively uncovering the solar disc, until the event is over.

There is insufficient room here to provide times for all of Canada, so here is information for a selection of Canadian cities. There are four numbers: the local times for the start, maximum and end, and the maximum fraction of the solar diameter covered: Victoria (09:08, 10:20, 11:37, 91%), Vancouver (09:10, 10:21, 11:37, 88%), Penticton (09:13, 10:25, 11:42, 87%), Calgary (10:20, 11:33, 12:50, 81%), Edmonton (10:24, 11:35, 12:49, 75%), Saskatoon (10:29, 11:43, 12:59, 75%), Regina (10:30, 11:46, 13:04, 79%), Brandon (11:36, 12:53, 14:11, 78%), Winnipeg (11:40, 12:57, 14:15, 76%), Toronto (13:10, 14:32, 15:49, 76%), Ottawa (13:17, 14:35, 15:48, 69%), Montreal (13:21, 14:38, 15:50, 66%), Quebec (13:26, 14:39, 15:49, 61%), Charlottetown (14:32, 15:50, 16:54, 55%), Fredericton (14:32, 15:47, 16:53, 58%), Halifax (14:42, 15:52, 16:58, 58%), St. John's (15:29, 16:29, 17:24, 43%). If you live somewhere else, pick the nearest city to you and start observing a little earlier. And remember to enjoy the event safely.

Jupiter shines brightly, very low in the southwest after sunset, and Saturn low in the south. Venus rises in the early hours, shining more brilliantly than Jupiter. The Moon will be New on the 21<sup>st</sup>.

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