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## BUILD A PLANET - 2016

Ken Tapping, 9<sup>th</sup> August, 2016

On the nights of 12 and 13 August 2016 the Earth will undergo another stage in making a planet. It will pass through the core of a stream of meteoric debris; we will see the 2016 Perseid Meteor Shower, and our world will get a little bigger.

Along with the Sun and all the planets of the Solar System, our world was mostly made some 4500 million years ago when a cloud of gas and dust collapsed. Little bits stuck together making bigger bits, and those bits hit other bits and the lumps got bigger. One of them got really big and formed the Sun. The rest formed the planets and the other bodies in the Solar System. Although the construction process is mostly over, it is by no means complete. There are still many objects moving around the Solar System, some of which are on potential collision courses with the planets.

In the outer reaches of the Solar System there are millions of lumps of rock, dust and ice up to a few kilometres in size. Occasionally a collision or some other disturbance puts a lump into a new orbit, one that takes it into the inner Solar System. As it approaches the Sun, it gets warmer, making the ice and other volatile materials evaporate. The resultant jets of vapour propel dust off into space, where solar radiation and the solar wind blow the lost material into long, spectacular tails, which we see in the sky as a comet. Each time the object passes close to the Sun it loses more material, causing its orbit to gradually become filled with a stream of debris. There are many comets moving around the Solar System, in various stages of disintegration. The one relevant to the Perseids is called Comet Swift-Tuttle, after its discoverers, who spotted it back in 1862. Its orbit is loaded with a stream of debris moving at about 60 kilometres a second. Every August the Earth ploughs through it at its orbital speed of 30 km/s. On 12-13 August we pass through the core of the stream.

Most of the fragments are very small, and the intense heat produced when they plough into the Earth's atmosphere at high speed totally

evaporates them. We see their demise as a short-lived, glowing streak across the sky – often called a “shooting star”. Stars are a completely different sort of thing, and a collision with one is something neither the Earth nor us would survive. The correct term is “meteor”. The meteor remains slowly drift down to the ground as microscopic dust, adding a little bit to the mass of the Earth. Some meteors contain iron, which we can collect by putting a strong magnet on top of a pole or on a roof. Check out what has been captured with a microscope.

This stream of meteors appears to come from the Northeast, in front of the constellation of Perseus, hence its name, the Perseids. You don't need a telescope to see them, just a dark sky with a good view to the Northeast, shielded from street lamps. Take a blanket; it can get cold if you're lying still for long periods, even in August.

You can also listen to meteors by radio. Tune an FM radio to the frequency of a distant station that is too far away to hear normally, and you may hear little bursts of signal as the transmissions echo off the meteor trails. Usually the echo is just a short pulse of signal. Sometimes however the echo can last for some 30 seconds. This technique works in any weather, day or night. Here in Southern British Columbia, Sunny 102.3 FM, Modesto, California works well as a meteor detector. There are several meteor showers of various sizes each year. There are also meteors that are not part of showers, and can turn up any time, so it is worth checking out the sky for meteors on any clear night; you can check out the radio method any time. Make sure you spend some time outside on the 12<sup>th</sup> and 13<sup>th</sup>, and for evenings either side of that date, and try adding a new station selection to your car radio.

Mars and Saturn lie low in the southwest after dark. Saturn is to the left of Mars and fainter. The Moon will reach First Quarter on the 10<sup>th</sup>.

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