



NRC Publications Archive Archives des publications du CNRC

See the zodiacal light Tapping, Ken

This publication could be one of several versions: author's original, accepted manuscript or the publisher's version. / La version de cette publication peut être l'une des suivantes : la version prépublication de l'auteur, la version acceptée du manuscrit ou la version de l'éditeur.
For the publisher's version, please access the DOI link below. / Pour consulter la version de l'éditeur, utilisez le lien DOI ci-dessous.

Publisher's version / Version de l'éditeur:

<https://doi.org/10.4224/23000144>

Skygazing: Astronomy through the seasons, 2014-03-18

NRC Publications Record / Notice d'Archives des publications de CNRC:

<https://nrc-publications.canada.ca/eng/view/object/?id=51531908-414b-4940-bc8d-c55ce1f0ecb7>

<https://publications-cnrc.canada.ca/fra/voir/objet/?id=51531908-414b-4940-bc8d-c55ce1f0ecb7>

Access and use of this website and the material on it are subject to the Terms and Conditions set forth at

<https://nrc-publications.canada.ca/eng/copyright>

READ THESE TERMS AND CONDITIONS CAREFULLY BEFORE USING THIS WEBSITE.

L'accès à ce site Web et l'utilisation de son contenu sont assujettis aux conditions présentées dans le site

<https://publications-cnrc.canada.ca/fra/droits>

LISEZ CES CONDITIONS ATTENTIVEMENT AVANT D'UTILISER CE SITE WEB.

Questions? Contact the NRC Publications Archive team at

PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca. If you wish to email the authors directly, please see the first page of the publication for their contact information.

Vous avez des questions? Nous pouvons vous aider. Pour communiquer directement avec un auteur, consultez la première page de la revue dans laquelle son article a été publié afin de trouver ses coordonnées. Si vous n'arrivez pas à les repérer, communiquez avec nous à PublicationsArchive-ArchivesPublications@nrc-cnrc.gc.ca.



SEE THE ZODIACAL LIGHT

Ken Tapping, 18th March, 2014

In spring the ecliptic, the path among the stars followed by the planets, comes up from the western horizon at a steep angle. In addition to making planet viewing possibly better, it also makes this time of year best for observing the zodiacal light.

We've all seen construction sites just after a building project has been completed. There are piles of debris, waste and unused materials that await removal. Our Solar System is much the same. It is a construction project that is in its late stages, with lots of unused material lying around.

It was formed about 4.5 billion years ago when a cloud of cosmic gas and dust collapsed. Like most cosmic clouds, that primordial cloud was spinning very slowly. We've all seen how when a gyrating skater pulls in her arms, she spins faster, and her skirt flares out. Since the collapsing cloud shrank by an enormous amount, that original slow rotation accelerated enormously, and just as in the case of skater's skirt, it flared into a flat, spinning disc. The central part went on to form the Sun and some of the rest of the disc material formed the planets.

The remaining material is still out there, in fragments ranging in size from fine dust to chunks many kilometres in diameter. Every day the planets sweep up a little bit more of it, and grow a little larger. There is still a tremendous amount of stuff out there to be swept up.

Most of it is in the form of a disc of very fine dust, orbiting around the Sun along with the planets. It is usually hard to see. However at this time of the year the nights are dark and the plane of the disc, which coincides with the ecliptic, comes up above the western horizon at a steep angle. This is a good time to see the remains of that ancient disc. It looks like a pillar of light ascending into the sky from the western horizon, or like a second Milky Way. You are seeing countless grains of dust lit up by the Sun. Binoculars will show it to be very different from the Milky Way. Instead of countless stars, this belt of glowing dust shows no detail, just

a diffuse glow. The old term for the ecliptic path in the sky is the zodiac, and the glow became known as the zodiacal light. To see it you will need a dark, clear sky. Haze or light pollution will make it hard or impossible to see. When looking at it, remember that you are seeing actual, original building material from which the Sun, Moon, Earth and other planets were made.

On 20 March there occurs one of the astronomical events we've been looking forward to for months, the beginning of spring. This is marked by the Sun crossing the celestial equator, heading north. The celestial equator is an imaginary line in the sky exactly above the Earth's equator, dividing the celestial sphere into northern and southern hemispheres, just as the equator does for the Earth. When the Sun lies on the celestial equator we have equal hours of daylight and darkness, which is what "equinox" means. For most of us the weather still thinks it's winter, but at least the equinox hints at something to look forward to.

For thousands of years the equinox was celebrated as a time of fertility and renewal, dedicated to the goddess Eostre. When Christianity spread across Europe it assimilated this and other festivals. However, in order to ensure this rededicated celebration took place at the same time in churches everywhere, there had to be a consistent formula to keep the celebrations synchronized. At the First Council of Nicaea in 325 AD, the celebration was scheduled to occur on the first Sunday following the first Full Moon following the spring equinox. However, despite the rededication, Eostre's name lives on – as Easter.

Jupiter lies high in the south at nightfall and dominates the southern sky overnight. Mars and Saturn rise around 9pm and 11pm respectively. Venus rises around 5am. On 23 March, the Moon reaches Last Quarter.

Ken Tapping is an astronomer with the National Research Council's Dominion Radio Astrophysical Observatory, Penticton, BC, V2A 6J9.

Tel (250) 497-2300, Fax (250) 497-2355

E-mail: ken.tapping@nrc-cnrc.gc.ca

