



In ancient times man beheld the wonders of the universe through dark, clear skies. With only his eyes to tell him what lies above, he populated the sky with heroes and heroines, animals and objects while yearning to know more.

However, with the discovery of electricity and the invention of the light bulb, it was not long before city streets were being lit by unshielded light bulbs.

As tentacles of light began to conquer the cities, and the glow of waste light filled the night skies, astronomers had to take their delicate instruments farther into the country. The telescope and its related light-gathering and analyzing instruments were being blinded by the advancing glow of the electric light. Night sky lovers and astronomers were losing the battle for dark skies. To the present day the stranglehold of light pollution has continued to increase unabated.

A 'Hunter's Moon' in October rises slowly over the bare trees. This is one of the few astronomical objects visible to the night sky observer in Alberta's towns and cities as light pollution obscures all but the sun, moon, planets and brightest stars.

Most astronomers rely on light as the main messenger from the stars. The colours of the spectrum tell us the story of from whence we came, the creation of our sun, its planets and the very elements of which we are made. Light also tells us of the distant past and the means by which the universe will end in the far future. To learn from the stars, it is vital that this light be uncontaminated to accurately obtain and decipher this vital information.

Light pollution, first in the form of incandescent lights, followed by mercury and sodium varieties, has steadily overrun the civilized world. As a result, many large telescopes and science instruments now lie virtually useless.

Some observatories have had to be abandoned or moved. In Canada, major observatories such as the David Dunlap in Ontario and the Dominion Astrophysical Observatory in B.C. have become incapacitated with the effects of light pollution. Modern observatories are now found in very remote places, usually on mountaintops where the air is clean and clear, unpolluted by human activity or lights. Many astronomers have found it increasingly difficult to work with their instruments close at hand and now rely on remote automatic instruments to gather the precious light, record it then transmit it home.

Consequently, astronomers have lost touch with the very instruments and stars from whence comes their information. That personal experience of direct contact with their object of study has been lost, much of it due to the effects of light pollution.



M42 – The Great Orion Nebula.
NASA – Hubble photo.

An object of intense scientific interest, The Great Nebula in Orion, is one of the wonders of the night in late winter and early spring. In a dark sky, it shimmers at the edge of visibility with the naked eye. In a telescope, it is a wonder to behold and admire. Here, stars are being born! Light years in diameter, its colorful tendrils of gas and dust reach across space, protecting the cocoons of dim red stars at the very edge of life. However, this stellar nursery pales under the onslaught of city lights, its faint, wispy trails lost in the immense light domes covering the night sky.

Since most objects of astronomical interest are faint, they are not usually visible under urban conditions. Only the sun, moon and planets, along with a handful of stars are visible at any time. This situation severely limits astronomical and space education as, in the urban telescope, these objects are dimmed or fogged. Schools have lost interest in astronomy programs and activities and educational programs at public observatories, such as the Telus World of Science, are compromised. Anyone who wants to see the wonders of the universe for him/herself, is then forced to travel far into the country, if there is a site to which one can go and from which one can observe.

If the observer wishes to take photos, the film or digital images of the dim objects are often ruined by stray light. There is no alternative but to travel to a dark site hours away from home. As most of central Alberta is now covered by an immense light pollution dome, good observing sites are becoming increasingly rare.

However, some municipalities, such as the Municipal District of Foothills No. 31, are enacting light abatement bylaws in consideration of what is being lost.

Travel also adds to the cost of research and teaching in money, time and personal costs for astronomy as a profession, hobby or interest. Today's students or hobbyists often don't see these objects directly, their observations limited to sterile images on their computer screens.

The U.S. and other countries plan to develop colonies on the moon and eventually on Mars. Thus, astrophysics is becoming increasingly important. For people to be educated without even being able to see these objects is not only a travesty, it is not the best approach to science education. Light pollution is having a profound effect on studying the universe and teaching about it. We are now in a battle to save the last of our dark skies for future generations.