

COMMENTARY

Time to turn off the lights

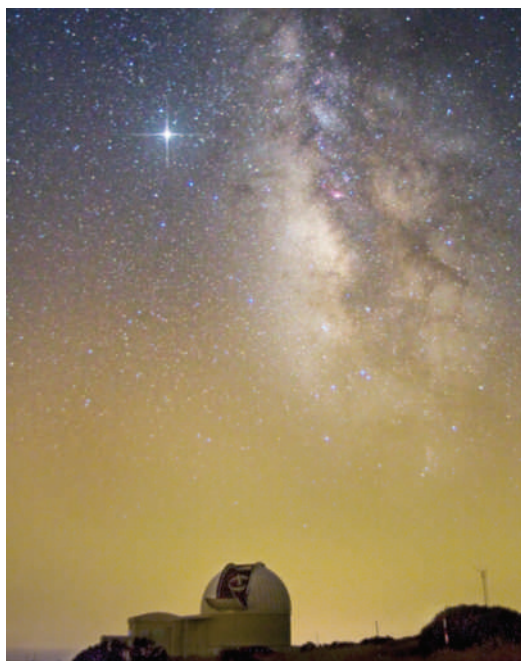
Cities needlessly shine billions of dollars directly into the sky each year and, as a result, a fifth of the world's population cannot see the Milky Way. **Malcolm Smith** explains why a dark sky has much to offer everyone.

Over the past six decades, professional and amateur astronomers have been pioneering efforts to curb light pollution to protect the viability of their observatories. During the 2009 International Year of Astronomy, particularly through the Dark Skies Awareness project¹, astronomers can find allies in a common cause to convince authorities and the public that a dark sky is a valuable resource for everyone. Reducing the number of lights on at night could help conserve energy, protect wildlife and benefit human health.

The most persuasive arguments for lighting control are economic ones. Estimates by the International Dark-Sky Association, based on work from satellite images², show that cities needlessly shine billions of dollars directly into the sky each year. As education on these issues improves, some cities are now realizing the benefits of controlling such energy waste through better-quality lighting, thereby reducing dangerous glare and confusing lighting clutter. Recent cost-saving measures in New York include lighting codes that require dimmers and motion-sensor-enabled light switches in many buildings.

Although humans are generally comfortable in artificially lit environments, man-made light sources can sow confusion for other animals, often with deadly results. For example, initiatives run by the National Audubon Society in New York, or Toronto's Fatal Light Awareness Program, focus on the effects that lights can have on bird migrations. In more and more cities in Canada and the United States, switching off at least some of the light in nearly empty skyscrapers reduces the unnecessary annual slaughter of millions of migrating birds in North America³. Some authorities now recognize that lights that are switched off during the migration season are probably not necessary. Yet, some cities still switch them back on when migration is over. There are many other examples and opportunities for cooperation³⁻⁵.

Humans are affected too, especially as urban areas expand worldwide⁶. More than two-thirds of the US population and one-fifth of the world's population have lost naked-eye visibility of the Milky Way⁷. This has a subtle cultural impact. Without a direct view of the stars, mankind is cut off from most of the



Village lights reflect off Saharan dust beyond the Teide Observatory on Tenerife, obscuring stars near the horizon.

Universe, deprived of any direct sense of its huge scale and our tiny place within it. Satellite and nightscape photos have illustrated beautifully just how much humans stand to lose. The work of The World at Night photographers has been incorporated into efforts for the International Year of Astronomy⁸. The International Astronomical Union has recently signed a memorandum of understanding with the United Nations Educational, Scientific and



Cultural Organization (UNESCO) to pursue the goal of identifying and protecting astronomical sites of historic significance. And the UNESCO-supported Starlight Initiative⁹ has a major international programme investigating more deeply the issues discussed here. The potential for profitable ecotourism, associated with protected, natural, starlit skies is now being understood in many countries. The US National Park Service has launched a highly successful night-time-visits service in a joint effort between astronomers and park staff.

Even our physiology is deeply entwined with dark-light cycles. Recent research shows that light at night triggers signals that cause a reduction in the normal production of melatonin, a

suppressant of cell division in cancerous tissues¹⁰. It is imprudent to draw any grand conclusions yet, but we should continue to work with medical professionals to see if there are opportunities for cooperation.

Our relationship with artificial light is complicated and changing. Humans innately fear the darkness, and modern society relies on light as a security measure even though there is no evidence that controlling light wastage increases crime levels. Moreover, blinding automobile headlights require higher levels of street lighting to recover visibility of what's behind them. In many places in the world, one can drive around moderately lit, smaller towns with side lights. In the countryside, moderate headlights can be supported with catseye road reflectors.

As light fixtures with energy-efficient, light-emitting diodes start to become more widespread, the International Dark-Sky Association has been harnessing the support of professional lighting engineers and other non-astronomy interests to encourage responsible, innovative lighting and guidance design. Although it will be challenging, we can work together to reduce the form of pollution and energy waste that is, arguably, the most easily mitigated. ■

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