

# Don't light up the night sky



Too much illumination is drawing a shade over well-being, says S.Aanthanarayanan.

It is well known that star gazing from within a large city is not as rewarding as from the open countryside. The reason is that the glare of streetlights and other illumination in cities gets scattered back and interferes with the dim light from the stars. The stars then do not appear so bright and the fainter ones are not seen at all.

## Away from glare

But in the countryside, there is no scattered background illumination and the night sky looks ever so much brighter. This is the reason that large telescopes and observatories are located at remote places, well away from city lighting. Another source of obscuring of images is the scattering of starlight by the atmosphere. For this reason, telescopes are often located on mountain tops, so that there is less of atmosphere between the telescope and the stars being viewed. But in all cases, the telescope needs to be away from the glare of city lights.

The presence of background illumination not only obscures faint images but also affects the sensitivity of the eyes to detect feeble signals. When scientist CV Raman and his associates were engaged in spotting the very faint scattered and modified light which forms the Raman Effect, the experimenters' eyes had to be at their most sensitive. To make sure, the experimenters were confined in a darkened chamber for a full hour before they started observation. CV Raman did his work on the Raman Effect in the Indian Association for the Cultivation of Science laboratory at Kolkata. The darkened chamber for sensitising eyes had thus been named the ***Black hole of Kolkata***.

In a review article in *Nature*, astronomer Malcolm Smith finds that there are more reasons than star gazing to keep the night time illumination levels down. Smith has reviewed the findings of

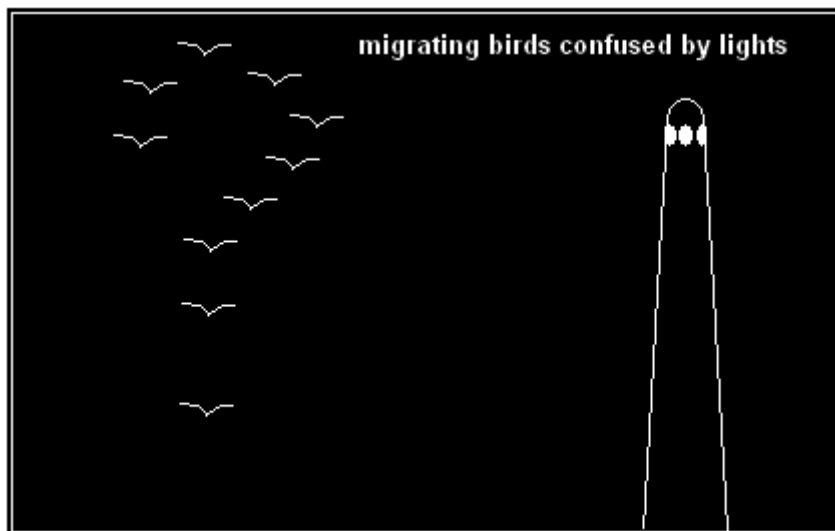
different groups that reduction of night-time darkness has economic, environmental, cultural and medical effects. According to the International Dark-Sky Association, the long-term effect of light pollution will do much more than burn a hole in our pockets.

### **Economics**

A major consumer of energy is the lighting industry. Unplanned illumination not only creates light pollution but also results astronomical costs in electricity and light fittings. A study by the *International Dark Sky Association*, which is based on satellite data from the dark side of the earth, finds that much of the world's lighting cost is in generating light that is not used but is beamed into outer space. Better designed lighting arrangements could result in huge economies, with no loss in the useful lumens. This is apart from avoiding the losses due to dangerous glare and other damage caused by incorrect lighting. And then there are the economies possible by eliminating needless lighting, like in passages when nobody is there.

### **Environment**

While people seem to have adapted to light at all times of the day and night, animal populations are generally adversely affected. Migrating birds, for instance, suffer severe discomfort, and lose many lives because of the confusion caused by brightly lit skyscrapers in their flight path. Some states have regulated the lighting of buildings during the season of bird migration and some of them have realized that the regulation could as well continue after the birds have flown past!



Many of us may be aware that animals in forests and reserves are thrown into confusion during a solar eclipse, when the light level drops during the day. The effect of increasing illumination during the night is found to be equally drastic, with human habitation taking a toll by lighting alone, even without destruction of foraging areas, natural habitat, etc.

## UNESCO

We all know that children in cities have often never seen common animals, like monkeys or squirrels and know of them only through picture books. But more serious is the fact that many of them have never seen the night sky in its glory. A good number of city dwellers have not seen the Milky Way, our own galaxy, the depth of whose disk paints the night sky with a swathe that has given it its name. And the glare of city lights often hides from sight many constellations and important stars that form a part of our scientific and cultural heritage.

The International Astronomical Union has recently signed an agreement with UNESCO that unobstructed view of astronomical formations is world heritage and as important to protect as historical sites and natural history. A Starlight Reserve (like a wild-life reserve) is in the process of being set up in New Zealand in Lake Tekapo and Aoraki Mount Cook sites, which are renowned for the clarity and brilliance of their night skies. “It really is a wonderful night sky here and there are very few places left in the world now where you can get that view,” says Professor Phil Butler, head of physics and astronomy at the University of Canterbury. Many countries are beginning to understand that clear night skies have scope for eco-tourism. We are aware of the lure of the wild-life and the green cover of forests in much of India, but it is now being understood that the night skies in much of rural India is also worth protecting and exploiting!



## Physiology

While it appears that human beings are adapted to artificial lighting and distorted diurnal routines, what toll these conditions actually levy has not been researched. There are some

findings that exposure to light during night hours can suppress the production of melatonin, a hormone that controls many body cycles according to the rhythm of night and day. Following a disturbed cycle may be tolerated for its benefits in work and the high life, but its effect may be far ranging. Melatonin, for instance, acts as a suppressant of cell division in cancerous cells. It would not be considered far-fetched to directly indict disturbed exposure to light as a causative factor in cancer, but it appears that it is clear that there are many adverse effects.

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