Planetary Wonderings

August Focus: Dark Skies

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Most people are familiar with water, air and possibly noise pollution, but what about light pollution? *Light pollution* is any nighttime artificial light that shines where it is not needed. Is this a problem? Professionals and amateurs from numerous fields answer a resounding "yes." Stray artificial lighting wastes electricity and money; increases the production of carbon dioxide and other pollutants; disrupts wildlife by interfering with navigation, migration, and reproduction; is a health hazard to people; decreases, rather than increases security; is a safety hazard; and degrades the view of the night sky. Despite the efforts of cities around the US and, indeed, the world, to enact laws to help limit the sky glow from artificial lighting, light pollution continues to be a problem. Information on proper lighting from economic, ecologic, and security standpoints abounds on the web. This article briefly touches on the astronomical problem.

Let us look at light pollution from an observing position. Imagine going to see the beautiful mountains of Colorado or the Grand Canyon in Arizona. You expect to see some of the most stunningly gorgeous scenery on the planet, BUT when you get there the weather is either hazy or raining, obscuring most, if not all, of what you came to see. The night sky near and in urban areas is like this. Stray light interacts with the atmosphere causing sky glow. Night vision is ruined, further reducing the number of sky objects visible. Without leaving home one should be able to experience the awe of night sky objects such as planets, comets, meteors, nebulae, and the like. However this view for most of the US, European, and eastern Asian populations is degraded by light pollution. Indeed, it is believed that 20% of the world's population, including 67% of those in the US, cannot even see the Milky Way. What is the result of this for science? Space-based telescopes are great, but there is still much work that can be done on the ground, by amateurs and professionals alike, cheaper and without the hassles of launch and deployment. Stray artificial light presently hampers the use of Earth-based observatories. Rare astronomical events could go undiscovered. Amateur astronomers routinely discover comets, asteroids (sometimes, potentially hazardous asteroids), and monitor the brightness behaviour of thousands of stars. Less than two weeks ago an Australian amateur astronomer discovered a black spot on Jupiter indicative of a comet or asteroid impact. Days later another amateur discovered a white spot on Venus, possibly from a volcanic eruption. Increasing light pollution makes these discoveries more and more difficult, if not impossible. How might science education be effected if students cannot make simple observations of the night sky? How can children gain an appreciation for astronomy if they can barely see the Big Dipper, if at all? Light pollution jeopardizes the very future of the study of space.

The goal of preserving the wonder of the universe significantly, if not entirely, overlaps with that of conserving the planet's ecology as a heritage to its children. So, any effort made to make or keep skies dark for astronomical observations also has the benefit of cutting greenhouse gasses, saving money, etc.

Several organizations help promote dark sky awareness. The International Dark-Sky Association (http://www.darksky.org/) distributes timely information on the subject through its Facebook page and educational resources, including steps homeowners can take to decrease extraneous light from their houses via its website. The International Year of Astronomy 2009's Cornerstone Project has a website dedicated to dark skies awareness at http://www.darkskiesawareness.org/

where one can learn about dark sky activities and events. The Light Pollution Science and Technology Institute monitors sky brightness and stellar visibility via satellites. Maps produced from this data may be found at http://www.lightpollution.it/worldatlas/pages/fig1.htm and elsewhere on the website. Other groups concerned with dark sky awareness are listed below under "Sources."

Resource of the Month: Though the year is more than half over EarthSky's Meteor Shower Guide for 2009 at http://www.earthsky.org/article/earthskys-meteor-shower-guide is still useful. August is the month of the Perseid meteor shower. This guide mentions that shower as well as other showers throughout the year, including observing tips.

Activity of the Month: Though having nothing to do with astronomy, but related to dark skies, consider joining Firefly Watch, a citizen science project to help experts monitor the health of lightening bug populations. For more information check out https://www.mos.org/fireflywatch/about_firefly_watch .

When the fireflies are gone, those who want to help scientists monitor the night sky are encouraged to participate in the third annual worldwide Star Count event in October (www.StarCount.org).

Other websites mentioned in this article are chocked full of other dark sky activities and demonstrations.

Suggestions, questions, corrections, and comments about "Planetary Wonderings" are welcomed and may be directed to stargazer @ keeplookingup.net (remove spaces). Past columns may be found at www.KeepLookingUp.net (click on "Planetary Wonderings" on the right side of opening screen) and at http://www.freelists.org/archives/astronomyed/ (columns from Jan. 2007 to the present).

Remember to *keep looking up!*

Sources (not already mentioned in the article):

http://ngm.nationalgeographic.com/geopedia/Light_Pollution
http://www.lightpollution.it/indexen.html
http://www.darkskiesawareness.org/
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