

Everyone wins with good lighting

We love working with our member/owners. Especially the passionate ones. When that passion matches up with an issue we're involved with, it makes sense to work together.

In that light, we're excited to feature a guest columnist this month. Mike Lockwood is the owner of Lockwood Custom Optics. His company specializes in providing high-quality optics for astronomers, telescope builders, scientists, and researchers.

On a dark night in the country, bright lights dot the horizon, marking the location of farms, businesses, and homes. This seems perfectly normal to most people, but in reality it is part of one of the largest wastes of energy in the modern world.

Your co-op is in the business of providing dependable electricity to its member/owners, but they also offer lots of advice regarding energy efficiency because they want their member/owners to make the best use of the power that they buy.

There is a revolution currently going on in the world of lighting. LEDs are now the most efficient source of light, and they are now being widely used in homes and for street lighting. This LED revolution has also brought great improvements in how we can efficiently light outdoor areas.

We're all familiar with a lamp shade. It keeps the direct light out of your eyes when you turn on a lamp indoors. Without it, we're blinded by the glare of the light bulb itself. The shade also serves to direct the light where we want it to go.

When an outdoor space is lit, even with a bright light, you can see well under or near the light, but not very well a modest distance away. If we can direct outdoor lighting better, we can get more of the light where we need it. This allows us to avoid both wasting energy and lighting areas that we don't want to light.

When it is dark, our eyes are more sensitive to light, but that is wiped out when we have a very bright light shining in our eyes. Lights that don't have a "shade" or shield

by, or the police can't see if there is something suspicious going on because they are blinded by glare created by the unshielded light.

The goal with outdoor lighting should be to direct the light to the ground where it will do the most good. We also want to shield the actual bulb from view, and of course we want to do it all as efficiently as possible.

This reduces glare as much as possible, improves visibility tremendously, and saves a lot of



on them to block the blinding brightness of the bulb itself create glare, and actually interfere with us seeing well.

It's the same as having a car's high beam lights shining in your eyes, or when you are driving with the sun in your eyes. It is easy for you to miss things on the road in these situations, and likewise it is easy for people to hide in shadows in this situation because we are literally blinded by the light. If you have a bright, unshielded light on, your neighbors, those driving

energy. That is exactly how the new LED street lights work. LEDs are directional by their nature, meaning the light coming out of them goes mostly in one direction. This is an advantage for nighttime lighting because it is easier to put light where you want it and where it is most useful – on the ground in the area that you need to see in.

To use another analogy, when you set up a lawn sprinkler, you try not to water the street, driveway, and the side of the house. Doing so would be just a waste. Likewise, it

makes no sense for a light to spray light in all directions where it will do no good. It is better to control where the light goes and keep it near the light fixture where it will do the most good.

Eastern Illini is now installing shielded LED fixtures in place of their old mercury vapor and sodium vapor dusk-till-dawn lights. When installed properly with the LED fixture leveled, the light shines downward, you don't see the bulb from a distance, and wasted energy is greatly reduced. You can't see the light from a distance, you can only see the area it is lighting, and this makes for the best possible visibility. This is the future of lighting!

This is why Eastern Illini asked me to write this article. I'm a member/owner, an electrical engineer by education, and I now make my living running a small business that makes telescope mirrors. I enjoy observing the sky at night and watching meteor showers, etc. I also enjoy night time photography of the sky and thunderstorms.

These things that are important to me and my business were made virtually impossible when my neighbor's very bright, unshielded mercury vapor pole light was turned on by the cooperative. The light ruined my night vision when I would walk out onto my deck to view the sky. It even lit up the inside of my house.

I contacted Eastern Illini and talked to them about the problems that I was having. Shortly after our conversation I found out that a new shielded LED fixture would be installed at my neighbor's home. About a week later, the new light was up, and after it was leveled, the light trespass on my property was all but eliminated. Now that's what I call service!

The great thing is that in this case, my neighbor got a more effective light, and I got the sky back. Everyone wins when good lighting is used – the property owner gets better illumination of their property, neighbors get darkness if they want it, it is easier to spot suspicious activity, and lots of energy is saved. Everybody wins!

Most people are simply uncomfortable with darkness, and they FEEL safer when their yard is lit up all night. It is far better in terms of energy savings to use a motion detector light that comes on when movement is detected. Another simpler alternative is to simply use a light that is controlled by a switch, and only turn it on when necessary.

In fact, most electric providers, have stopped calling "dusk-til-dawn" lights "security" lights because there is no proof that they provide better security, and claiming as such puts the electric provider at legal risk. Government studies have shown that outdoor lighting does not reduce or prevent crime, and a few studies from the US and other countries have shown that it can actually increase crime, likely by illuminating potential targets and making it easier for criminals to access them.

So, the moral of the story here is that

high-efficiency, shielded lighting, installed properly, results in better visibility for the homeowner and neighbors, reduced energy use and better efficiency, and darker skies for all to enjoy.

And you thought it was just a light.



This series of images starts with an old high-pressure sodium outdoor light (above). As you can tell, much of the light is shining out and up - not where it is supposed to be. The middle image shows an LED light that is not quite angled directly down to the ground. The bottom image is a correctly positioned LED outdoor light. The light is shining where it supposed to, and there isn't much extraneous light.