Cheap Observer's Report

Fighting Light Pollution

By Alex McConahay

Let's say light pollution comes in two forms: General and Local. General is that caused by lighting in the big city. The whole sky glows because of thousands of lamp posts and buildings doing what they do. Local is what happens right near our observing sight. Brad's lights and the horse lights at GMARS are examples. But so are the many lights we observers (and Imagers!) afflict on ourselves.

The Cheap Observer cannot do much about general light pollution in the short run. But local light pollution may be beatable.

Obviously the best way to control local light pollution is to isolate one's equipment from the source. Build an opaque wall between you and the light source, and you have pretty much won. (Well, at least you have beaten the other guy's light polluters). Currently at Goat Mountain, this costs about $5000 and lots of sweat equity, and $250 a year. This is hardly a Cheap Observer solution.

While I doubt any of us would consider Bill Patton or Rick Debus "Cheap Observers," both have started to employ their own less expensive general alternative to local light pollution. Bill purchased for a couple of hundred dollars, and Rick manufactured for about half that cost, a portable "observatory."

Orion setting a few months back at GMARS shows that Light Pollution can be both general (see the lgeneral glow along the horizon behind the telephone poles—the lights of Los Angeles, San Bernardino Valley, and Victorville glowing into the night sky) and local. The local includes neighborhood house and "security lights." But it also includes self-inflicted local lighting from computer screens, camera and other equipment (led) pilot lights, and the reflections of all these lights off ourselves. We are aglow.

Rick Debus prepares for an evening with his home-made light and wind shield. It is made of PVC pipe, fittings, setscrews, opaque felt, support ropes and stakes, spring clamps, and velcro straps (see inset). It takes something like half an hour to set up completely, but provides complete protection from local light pollution and some wind.

Each is made of a framework of white PVC piping, connected by standard plumbing elbows and tees. Set screws in various places hold this together (since standard PVC gluing would make things hard to disassemble and less transportable). In addition, both use stakes, ropes, and bungees to hold the frame down. The frame rises to about six feet, with four or six sides, and a small opening for a doorway passage. Opaque black cloth is draped over this frame with Velcro or grommets and hooks.

Bill reports that, properly staked down, his observer's light shield withstands about 25 mile per hour winds, although he would not like to try it in more challenging conditions. It does offer wind protection in general, and very much cuts off the local light pollution. These wind/light shields are particularly useful for imaging rigs, refractors, and SCT's, but a big dob is lower and could be limited by putting a wall around it.

By the way, I took particular notice of Bill's since my computer monitor was, I believe, the chief inspiration for it.

Although the club has worked extensively on light fences and strategic positioning of observatories and RV's to block certain sources of local light pollution, one tool has not been used much. Alongside some pads, existing infrastructure (a wire hanging line north of the pads, and poles for the north-south pads) allows one to hang a tarp that effectively block light coming from certain directions. Especially since the infrastructure is already there, and the tarps are in the garage, this would be a very inexpensive alternative.

But, you know, we are often our own problem when it comes to local light pollution. I'm not pointing fingers here as much as raising my own hand as a guilty party. (But I know I am not alone in this offense.) The pictures at the bottom of this page show that our various computer monitors, chart lights, light emitting diodes, camera viewscreens, observatory spillover, and all that add significantly to the amount of light bouncing around Goat Mountain. It is true that much of this is red light, or filtered to appear red. But even red light affects night vision, is sometimes not needed, and should be limited. And there are things a Cheap Observer can do to limit his or her own light intrusion.

Computer Monitors should be dimmed, filtered, pointed away from others, and covered. Note the "and" is not an "or." Don't just dim, or use a filter. Don't do one of these things. Do them all.

Dimmed does not take any money. Simply use the computer controls to select a lower light output on the computer. And while you are at it, use the night vision mode available in nearly all astro programs. They are not generally dim or red enough to use as a total solution, but they do help dim things down.

Filtered also is a must. There are a number of solutions available from the internet, including those that cost $29 and up. Of course our own RAS store offers the same red plastic cut to various sizes for less than that (see Jeff Huhs or Eric Elliott). Want to go even more Cheap Observer? Try Rubylith, available by Google search for $14 for a sheet large enough to cover your laptop. Best deal of all—use some of the Rubylith we still have in the GMARS Garage. Using this, a frame cut from pasteboard, and a couple pieces of tape, and you have a very nice filter for free.

Turned Away is also free, and fairly easy to do. Simply point your computer screen away

"Physician, heal thyself." Well, Physician Bill Patton did heal MY local light pollution with his light shield, but the general admonition that we look to our own sources of light problems is still important. In the upper left is the spillover from my unimproved imaging setup, particularly the computer monitor. This is, I believe, why Bill decided to buy his shield. Sorry, Bill. I'm trying to do better. At the top right is light spillover coming out of the doors and reflecting off the gable of the roll off roof of a couple of our observatories. Bottom left is looking along the north row of pads. Notice all the lights we have inflicted on ourselves. Notice how we are able to light up even the ground with our spillover. And if you still doubt that we are putting out too much light, notice how the led pilot lights from a CCD camera are reflecting off the sand ten feet away in the lower right. Most of this is red light. But it is still very bright for those who want the best night adaptation.

from other observers. However, beware that computer screens glow, and in so doing, the reflection of that glow can itself light up the viewer and an area. Particularly be aware of a car parked behind and reflecting nearly all the light from that screen.

Covered is a cool topic. That is because there are some really cool things to cover a computer monitor. David Morris, I believe, started the coolest trend, when he found the LapDome and brought it to GMARS. If you have not yet seen it, just imagine a little baby tent for your laptop. Stick you laptop in it, pull the USB and power cords through the back side access holes, and fire it up. You are no longer polluting most of the 270 degrees of the area around you. (Of course, you still have the 90 degrees or so you can see from the opening, and if you have not **filtered**, and **dimmed** the display, are yourself glowing back reflected light into the 270 degrees). You can zip the door closed, and even though your monitor is still glowing inside, nobody at all will be able to see the glow! They range in price from $25 to $80, and are available at Lapdome.com. See the pictures on LapDome for more details.

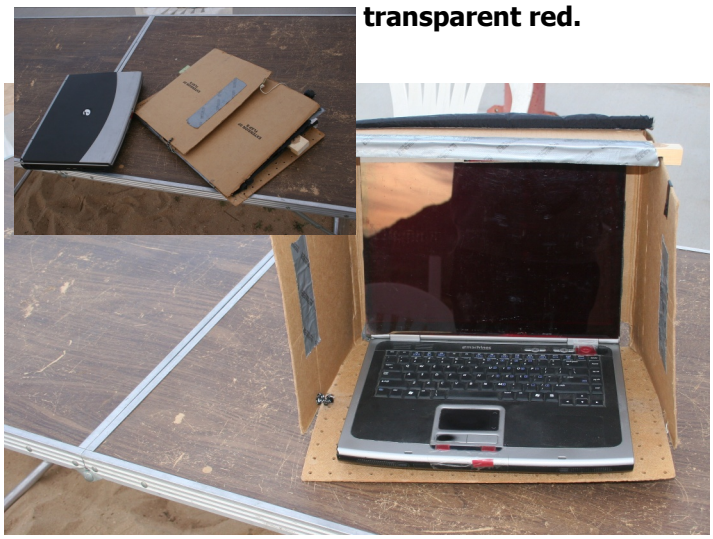
Cheaper than that? Try making your own cover. I made a folding arrangement, not nearly as cool as LapDome, but pretty handy. With some surplus pegboard, an old cardboard box, and some opaque cloth, it is a simple enough concept. Just cut out enough box to cover your bottom, sides, and part of the top of your computer laptop, Then tape the opaque cloth to the top such that it can be draped over the front when you are not actually viewing the screen.

Want it even simpler? Get a large (opaque) plastic storage box big enough for your laptop. Place it on its side and stick your open laptop inside. You can still see the screen, but the glow is blocked to the top, back, and sides. You can fancy this up by putting a few access holes in the back for pulling your power and USB cords through. And, you have a cool box to carry your laptop and astro-gear.

Before we leave the computer monitor, remember that most of the time the camera and computer are operating on their own. There simply is not much of a reason to be looking at the computer screen. So, cover it completely. Zip up the door on the Lapdome tent, or drop the opaque cloth on your home-made shield. Or, simply put a towel over the thing. No use having it glow into the night if you do not need to look at it.

Consider also some of the other electronic sources of light pollution. If you doubt that light emitting diodes can cause light pollution, you need only walk around the observing, and particularly the imaging, fields. (Or ask a few of the dedicated visual observers who have asked for an area set aside at GMARS where computers and imaging were forbidden!!!) Manufacturers somehow think that decorating electronics with led's make them better. Perhaps they

Cardboard and scrap pegboard makes a quite serviceable monitor cover. A black cloth (barely visible at top) can be dropped over the front to hide the screen completely. It folds up very compactly. Note on the laptop the red tape covering the various power-on, drive access, and other pilot lights. The tape is a semi-transparent red.



do in the normal daytime world. For astronomers, however, they are a source of light pollution which can be tamed fairly easily. A roll of electrician's tape will make their light go away. Simply cut a small piece and place it where it needs to be. You say you need to see those lights? If that is so (and really, how much do you ever look at them?) then substitute a couple of patches of blue painter's tape. It substantially cuts the light but the much dimmer glow still allows you to see if the device is sending out its signals.

Also free, and something that should always be done, is to turn off the DSLR viewfinder. They can light a wide area when displaying a captured photo (and are very annoying to many neighbors. Using 'Custom Functions' allows a quick shutoff of this annoyance.

One more suggestion: Look into an eyepatch. It won't stop light pollution from happening, but it can protect your night vision. Fact is, most of us have one eye more dominant. Put an pirate's patch over it (available for less than a few dollars at the local pharmacy, and even less in the toy store! (or for $6.00 at Orion). When you are at your star chart using a flashlight, use your unprotected less dominant eye. Then, when you get to the eyepiece, slip off the patch. You will be surprised that your eye can see much dimmer objects. Yes, it feels a bit strange and dorky. But, it does work when you need to find the really faint stuff.

Below, Carey Pooler readies his laptop for a night of imaging as his wife Vicki looks on. His LapDome will keep most of the light from spilling out the top and sides. But it does not keep light from coming out the front. Even in a LapDome, a laptop should have a red screen as at right (and be zipped up if you are not actually viewing it). For those who want to stop all light spill from their computers, and are handy at knitting, right, a few hours with needles and yarn will assure that they are not disturbed by, well, anybody (unless they are particularly sensitive to furtive whispers). The Lapdome has other uses when not on the observing field (bottom right).