

From Spruce to the Universe:

Objects in mirror are farther away than they appear

By Margaret Kelly

One of the delights of observing, even for beginners, is sharing sky objects with others. We think first of children when considering who is most likely to experience amazement and wonder but, often, a group of adults of mixed ages will be your most appreciative audience. We found this to be the case in October. Sheer luck brought an invitation to a mini-family reunion at a hunting lodge near Alpena during a dark moon and the same week Comet Hartley was due to be close enough to view.

We were not daunted by clouds as we packed the Orion Skyquest Intelliscope XT-8 ("the potato masher") with its factory issue right-angle finder scope into the Swedish Amateur Astronomy Bus (Saab) and threaded our



way north through Flint and Bay City, past Pinconning and Tawas, to our destination on about 80 acres of semi-wooded farmland outside the bustling town of Spruce, Michigan. This "hunting lodge" turned out to be a comfortable three bedroom house with a convenient deck facing south and, like all rural homesteads, a giant sky-brightening mercury lamp. Happily this one was able to be switched off in the kitchen.

The setting was just about perfect: the house was easily 500 feet of flat treeless field from the road; the nearest neighbors (and THEIR mercury lamps) were at least a quarter mile away, Alpena itself a distant 20 miles and, best of all, there was very little traffic on the road itself.

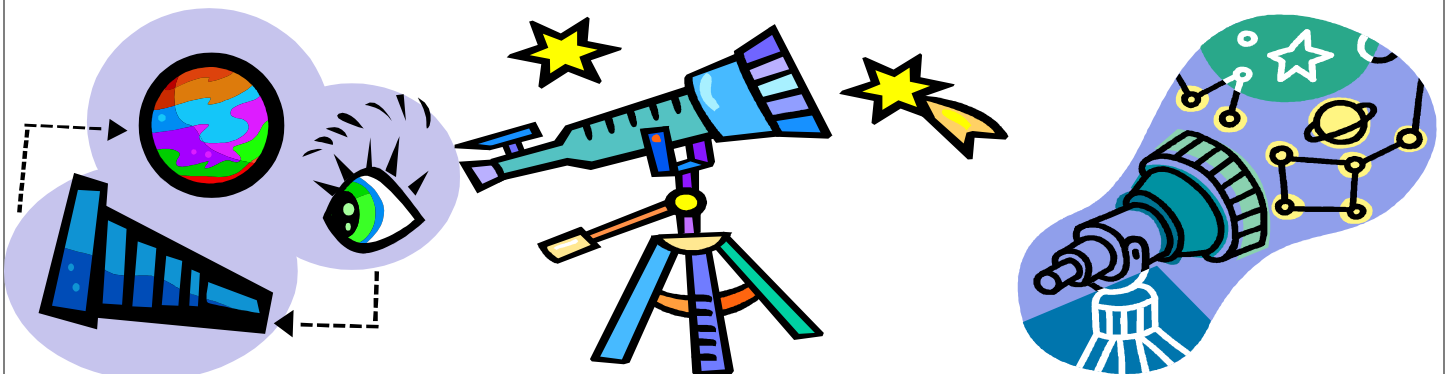
We set up the scope and some chairs on the front lawn near the rusty decorative vintage farm equipment just as the last clouds were disappearing. Cheerful complaints about the cold and dark mingled with shouts when a meteor was seen. Earth objects (gloves, hats, binoculars) were getting lost, chairs knocked over, and items sat upon. The author doggedly searched for the comet amidst questions and good natured ribbing. Jupiter rose over the pole barn and became an instant favorite. Who knew it had moons, and that you could see them with binoculars? And there was one of the dark bands, just like in pictures. Next, a mild argument broke out over whether Capella was an airplane or a star. Well, if it's a star, why does it have flashing lights? (or if it's an airplane, why isn't it moving?) This gave us a chance to train the scope on that object and explain about heat shimmer near the horizon.

Meanwhile something magical was happening... the glow in the West gradually dimmed to nothing, the grey between the stars was suddenly gone, and the full weight of the great river of light came down all around. I am sure there are darker skies but we had never seen one. There was literally too much to look at. We pulled in galaxies, clusters, nebulae, one after another, everywhere we aimed. The Andromeda group was the easiest to find of course, along with M-2, M-13, M-15, the Lagoon nebula, and a half dozen other things I couldn't reliably identify. And then, there it was... the least impressive object of all, Comet Hartley, in all its dim blue glory.

Let me point out that the party consisted of six adults, ages ranging from 50 to 90, most of who had been to college and some whom had even studied astronomy there. Everyone except the author and her partner had been to the site before, and yet none of them, not even the owner, seemed to have spent much time outside at night with the light off. They did not appreciate what a dark sky goldmine they could exploit without much effort.

So, what did we learn?

- 1. Bring a cache of reference materials so you don't sound like a dork when questions come up.*
- 2. Have plenty of binoculars on hand or fights may break out.*
- 3. Leave a red light on in your observing bag so no one falls over it.*
- 4. Serve the s'mores AFTER observing.*
- 5. Be prepared for amazement.*



“Star Light, Star Bright ... Please DON'T BE A HEADLIGHT!”

(a little [less?] light on star party etiquette) by Liz Calhoun

I've never been a night driver, not even when I was a young lass in the 70s and there were still unconnected stretches of I-69 between my hometown of Flint and Port Huron. The speed limit was a federally-set 55 m.p.h. and your stopping distance on expressways was a little better than it is now when cars travel at 70 m.p.h.+ on average. Nevertheless, between deer on the roads and my problematic night-vision, I just never really took to night driving.

Even driving to work in Ann Arbor in the dark October mornings, I can barely see past the unbearable glare of headlights coming at me, at 30 m.p.h., on Main Street. I'm always in a panic that I won't see a pedestrian crossing or cyclist near the curb, especially if they're not helping me out by wearing light clothing or some kind of reflective material. Let's face it: bright light in dark conditions is bad for accurate visual perception which is critical to operating a motor vehicle safely.

Then I took up astronomy and learned quickly that bright light in (highly-desired) dark conditions is bad for ... accurate visual perception, which is critical to observing just about anything celestial that isn't itself a bright-light object like the Moon in its fuller phases or Jupiter, etc.

Our Lowbrow Dave Snyder has written about the necessity of dark adaptation in his “Naked Eye Observer's Guide” available on our URL at <http://www.umich.edu/~lowbrows/guide/eye.html>

For a hobby that has few rules and regulations, amateur astronomy does have some universal statutes in an Internet-promulgated international “Criminal Light Code.” A basic Google search of “star party etiquette” returned about 330,000 results; and from a general unsystematic sampling of the first hundred results, you find the following repeated over and over again:

“Please don't use white lights. Use red lights sparingly. If for some reason you MUST use a white light, shout out a warning.

“Make sure your car doesn't violate the above. Backup lights and even interior lights can ruin someone's night vision. If you're planning to leave before dawn, park so as to be able to leave without using your lights or put duct tape over them.” [angeloastronomy.com]

Here's an FAQ for a star party whose answer comprehensively explains the problem:

“Q. Should I bring a flashlight ?

If you do, bring only small ones to keep the stray light low. Flashlight etiquette - point it toward the ground only. Cover it with several layers of red cellophane or use a red LED light. Red light doesn't affect our adaption to night vision ...”

[Note: the degree to which red light affects dark adapted vision can be argued. Bottom line: keep even a red light as dim as possible.]

“You will find that after a few minutes in the dark, without looking at the white beam of a flashlight, you will be able to see enough to walk safely on the paved path toward the astronomers. It takes 3 minutes to reach 30% of full night-vision-adaption; 30 minutes to reach 65%; but 3 hours to reach full night-adaption. One flash of light in your eyes will start the process all over again! So, please be respectful of others who are trying to get night-adapted!” [actonstarparty.com]

This selection from Amateur Astronomy Magazine pulls no punches in describing the swift retribution due the violator of the Code:

“No white lights after sundown if there are other observers in the area. Allow yourself to become dark-adapted and see all that you can see. If you are on dangerous terrain and need a bright red light, for heavens sake, keep it pointed straight down! Just because it is red does not mean it will not impact night vision. Don't walk around waving it in everyone's face. If you shine it in the eyes of the wrong person, they may instruct you where to stick it. If you have to open your car door or trunk after sundown, be kind enough to remove the fuse or bulb beforehand. It only takes a second. If you want

to become unpopular quickly, just be the one who is always ruining fellow observers dark adaptation by opening your car doors or trunk every few minutes, splashing bright light all over everyone.

“If you have to leave the party early in an auto, park where your lights will not bother those who are still observing, and in a manner that will allow you to not use your headlights or backup lights when you leave. Even brake and taillights are bright and can be bothersome to those who are fully dark-adapted. As a preparatory method, you can move the shift lever to neutral before starting your engine, and the backup lights won't come on...

[That is, if your particular vehicle allows you to do this.]

“If a bright light can't be avoided, just yell "LIGHTS IN THREE SECONDS" first, to give everyone time to turn the other way. You will be somewhat appreciated for your thoughtfulness! If you have one of the new cars that have "daytime running lights" that come on as soon as you turn the key, there IS a way to turn them off temporarily. Simply lift the emergency brake one click. Now you can turn the key without the lights coming on. After you drive a couple of hundred yards away from the observing group, remember to turn the emergency brake off, so you don't cause undo damage to the brake system.” [<http://www.amateurastronomy.com/etiquette.html>]

[Personally, I'm going to try this strategy, because I *do* now have a vehicle with these festering DRLs.]

And so the commandments go, club after club, star party after star party. The punishment tends to be fairly standard, too: violators GET YELLED AT. The violator is told not to take it personally but to educate him/herself by reading the darned rules before arriving at the event and asking for assistance.

But I've saved the best for last. From the Space Coast itself come guidelines from the Kennedy Space Center Amateur Astronomers which have a set of strongly-worded directives at <http://www.4saleusa.net/kscAA/et.html>. Although intended for first-time star party-ers, you can use these as operating guidelines for ANY star party or observing event. What caught my eye the most was this threatening reference to the universality of the “Criminal Light Code”:

“We don't mean to offend anyone with our rules. This is a formal star party, we have it only ONE TIME A MONTH. This is the only time some of us get out to dark skies with our big telescopes and we all want to enjoy the night and with your cooperation it will be a beautiful night. If you think some of our rules are tough then check with other astronomy club rules.”

The Space Between

By Rich Dworski and his Orchestra

I was sitting at the bar the other night when the guy next to me looked over his beer and said, “You know what I think is a lot of baloney? Virtual particles. That's right. Virtual particles. I mean, who can believe that particles can pop into existence out of nowhere?”

I considered this for a minute or two. I have personally heard direct, aimed-at-me messages over the radio telling me what to do, and have listened to strange communications late at night in the static on television channels which were tuned between stations, so virtual particles for me are not a stretch. However, believing something exists and proving it are two different things. My friend didn't believe in virtual particles because he'd never really looked at the proof. Of course, the problem could go deeper than that. Most people first decide what they believe, then look for proof to back it up, but I knew my friend was smarter than that, and since I once studied Physics, I thought I could convince him they exist.

Now, on a quantum level, all sorts of crazy things happen. Crazy even than receiving instructions from multiple voices coming in over the fillings in your teeth or seeing complicated evil conspiracies in every government action, which is really a phenomenon resulting from an overactive circuit in the brain which looks for patterns in noise. Do you see the Dalmatian in the picture below? Computers can't, because they don't have that circuit. Then again, they were never chased through tall shadowy grass by tigers.

Some of us turned up the circuit amplification and survived the tigers, but it's sometimes hard to survive the BS that we hear every day. It's hard to separate the merely weird from the bat-shit crazy, and virtual particles seem to fall squarely in the latter category. So I started by talking about the Heisenberg Uncertainty Principle.



Most people have heard that you can't measure both a particle's position and momentum simultaneously to any degree of accuracy. You can measure its position better and better, but then its momentum becomes more and more uncertain. Or vice-versa. Most people also believe that the reason you can't measure them both to unlimited accuracy is because the act of measuring involves bouncing photons off them just to see where they are, and the photons themselves add some uncertainty. This is wrong. Quantum mechanics actually lets you measure something without looking at it, but that is a side issue. Instead, position and momentum form a pair of operators whose product equals Plank's constant, and like any two numbers whose product is a constant, as one grows smaller, the other grows larger.

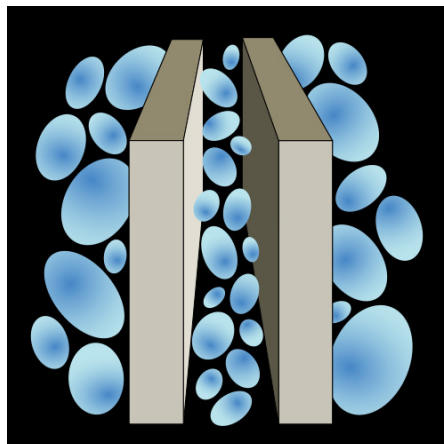
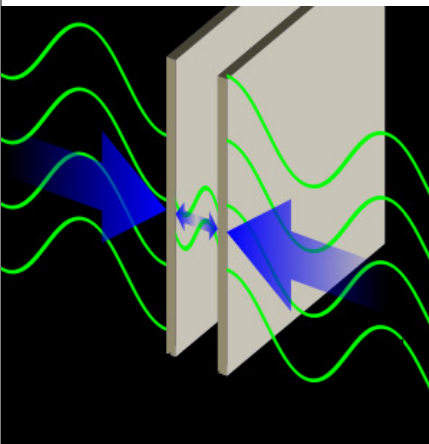
What is not commonly known is that energy and time form a similar pair. That is, the product of energy and time has a minimum value equal to Plank's constant. This means that energy can be borrowed from nothing at all if the time period of borrowing is short enough. The more energy borrowed, the shorter the borrowing period must be, and since mass is equivalent to energy, enough energy can be borrowed to make a particle if the borrowing period is short. And that's where virtual particles come from. I've even heard it said that photon noise is a result of plane waves interacting with virtual particles in space, but personally, that strikes me as a chicken and egg sort of thing.

Now, all of this argument is still just hand waving and maybe still craziness if there isn't any proof that these impermanent particles exist. But there is proof. Or at least a there's an experimental outcome that's hard to explain by any other means. It's called the Casimir effect.

Let's go back the virtual particles. We see that really heavy particles will only exist for a very short time, while lighter virtual particles can exist for longer times. In fact, particles of all masses can be created out of the vacuum, if only for an appropriately short length of time. From diffraction experiments, we also know that particles have a wavelength associated with them. This wavelength is shorter for heavy particles and longer for lighter ones, and the wavelength also describes the likelihood of finding a particle in a particular location.

In 1948, Hendrik Casimir thought that if he placed two parallel plates close to each other, so that long wavelengths wouldn't fit between them, he could prevent particles with long wavelengths from being created out of nothing in the space between the plates. There would be no restrictions on the particles which could be created on the outside of the plates, but fewer particles would appear between them. This would lead to a pressure imbalance, proportional to plate separation, which would push the plates together.

The experiment was extremely hard to do, but he succeeded in finding an "attraction" between plates which was within 15% of the predicted value.



Now, whether this constitutes "proof" of virtual particles or not is an open question. A lot depends on your definition of proof. I will say that here is no other explanation for this force between plates, and that physicists use virtual particles to explain all sorts of force levels in the atomic nucleus, and lastly, that the voices in my head say it's a good enough argument for them.

This article was submitted by Tom Ryan ... as if you didn't know!

Wood Wonders Eyepiece Case

A Review by Mark S Deprest

I'm a geek, a gadget-guy, a new technology nerd, I'm also the guy who usually has it (it refers to just about any thing and everything you just might need while out observing), which means I bring a lot of stuff with me when I go out observing. Now, I have a rather large telescope, Blondie is an 18" f/4.5 with a 2" focuser, so I use 2" eyepieces and because Blondie is a truss-tube dobsonian type of reflector the mirrors need to be collimated each time I assemble it for use. So, I have a laser collimator (actually I have two) and my scope is considered a fast scope and that makes it inherently subject to "coma distortion" which means I use a coma-corrector. I have pared down to a minimal number of eyepieces but I still have 4 2" eyepieces and a couple 1.25" eyepieces with 2" adapters. All of this plus a variety of filters in both 1.25" and 2", a couple of flashlights, a number of Brent Watson Telrad charts, the Pocket Sky Atlas, Sue French's Celestial Sampler book, a planisphere, a compass, a set of allen wrenches, a couple of small screw drivers, and a multi-tool ... well you get the picture (and if you don't get it check out the photo below). All of the this stuff comes with me every time I go out observing.



I used to pack all of this stuff in two separate cases and lay them open on my observing table, and that worked for me just fine. Then I went to the Black Forest Star Party and they had as one of the door prizes a Wood Wonders Eyepiece Case. Ron Burrows of Pinckney, MI has a complete line of these little beauties and he also makes the "Catsperch Observing Chairs" (I have one of these and I love it) and I wanted one of these eyepiece cases. So, I brought a few extra raffle tickets and put them all in the can for the eyepiece case. Just like I did when I wanted the 2" 1.5x Barlow a few years back, and just like I did when I wanted the P.S.T. A couple of years ago ... and what was great was I won the P.S.T., and I won the 2" 1.5x Barlow, and now I've won the eyepiece case. The Lowbrows are notorious for walking away with door prizes at the Black Forest Star Parties over the years.

Well, enough about that stuff lets take a look at this eyepiece case. The first thing you'll notice is the fine craftsmanship of these cases. Ron has done his homework and is a highly skilled wood worker. The joinery is biscuits and glue and he pays particular attention to the edges and corners, making sure all are sealed and cured before finishing with high quality poly-urethane. These distinctive, solid Red Oak, Eyepieces Cases are the ultimate in storage and display of your prized eyepieces and observing accessories. They have a red LED lighting system, which is activated upon opening the lid, with on/off-brightness control. With the pull-out drawers, storage underneath, and the flip-down Plexiglas storage partition in the top, there is plenty of room for all your essentials. All cases are coated with Minwax Helmsman SPAR Urethane for a protective clear finish that offers long-lasting protection for the interior and exterior that is exposed to sunlight, dew and temperature changes. The eyepiece layout can be customized to match your eyepiece selection or you can choose from 4 standard layouts. Ron makes two sizes:

A One Drawer Eyepiece Case

- 13.5"W x 9"D x 8.5"H.
- Solid Oak with brass hardware.
- Approximate Weight 8 lbs.
- Automatic Multiple Red LED illumination when lid is opened.
- On/Off Dimmer.
- Hinged Plexiglas inside of lid for reference material.
- Drawer upper storage 4-3/4" x 7-1/4" x 2"
- Lower compartment storage 5" x 8" x 2-3/4"
- Eyepiece clearance 4 1/2" upper 1 5/8" lower
- Lid storage 12" x 7-3/4" x 1-1/4"

**A Two Drawer Eyepiece Case**

- 20"W x 10"D x 8.5"H.
- Solid Oak with brass hardware.
- Approximate Weight 12 lbs.
- Automatic Multiple Red LED illumination when lid is opened.
- On/Off Dimmer.
- Side Drawers pull out for additional room underneath.
- Hinged Plexiglas inside of lid for reference material.
- Drawer upper storage 4-3/4" x 8-1/4" x 2"
- Lower storage 5" x 9" x 2-3/4"
- Eyepiece clearance 4 1/2" upper 1 5/8" lower
- Lid storage 19" x 8-3/4" x 1-1/4"



The one that I won was a Standard One Drawer type but I immediately upgraded to the Two Drawer model. Ron also offers some wonderful extras to enhance the exterior appearance. Besides the standard exterior Ron has two computer guided CNC carved patterns that he puts on 4 sides of these cases. I chose the Celestial version and he also offers a Mythological version. Please check out his website for all of the options available.

<http://www.wood-wonders.com/Eyepiece.htm>

Okay, so let's take a closer look at the door prize I picked up at the Black Forest Star Party and because a picture is worth a thousand words:



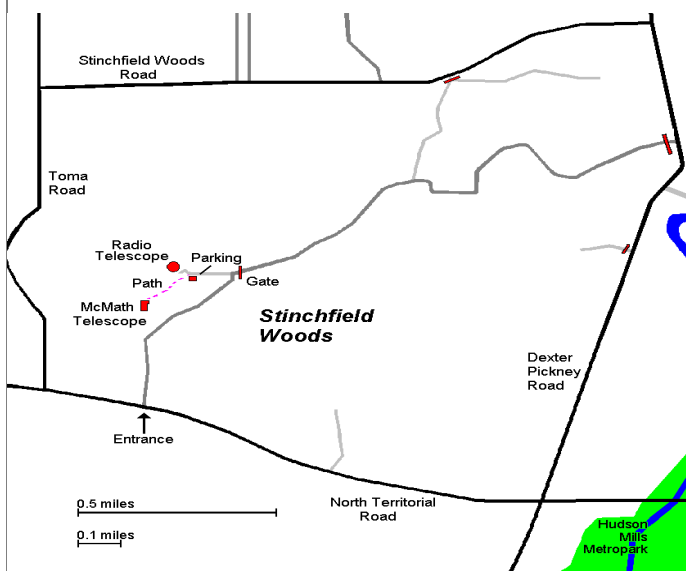
If you have been on the website you'll see that these are not cheap in any sense of the meaning they are high quality and rather pricey. However, now that I actually own one I can see why these babies are so popular and why they cost what they do. The bottom line is; these cases are worth every dollar and even better if you win one!!



Places & Times

Dennison Hall, also known as The University of Michigan's Physics & Astronomy building, is the site of the monthly meeting of the University Lowbrow Astronomers. Dennison Hall can be found on Church Street about one block north of South University Avenue in Ann Arbor, MI. The meetings are usually held in room 130, and on the 3rd Friday of each month at 7:30 pm. During the summer months and when weather permits, a club observing session at the Peach Mountain Observatory will follow the meeting.

Peach Mountain Observatory is the home of the University of Michigan's 25 meter radio telescope as well as the University's McMath 24" telescope which is maintained and operated by the Lowbrows. The observatory is located northwest of Dexter, MI; the entrance is on North Territorial Rd. 1.1 miles west of Dexter-Pinckney Rd. A small maize & blue sign on the north side of the road marks the gate. Follow the gravel road to the top of the hill and a parking area near the radio telescopes, then walk along the path between the two fenced in areas (about 300 feet) to reach the McMath telescope building.



Public Open House / Star Parties

Public Open Houses / Star Parties are generally held on the Saturdays before and after the New Moon at the Peach Mountain observatory, but are usually cancelled if the sky is cloudy at sunset or the temperature is below 10 degrees F. For the most up to date info on the Open House / Star Party status call: (734)332-9132. Many members bring their telescope to share with the public and visitors are welcome to do the same. Peach Mountain is home to millions of hungry mosquitoes, so apply bug repellent, and it can get rather cold at night, please dress accordingly.

Membership

Membership dues in the University Lowbrow Astronomers are \$20 per year for individuals or families, \$12 per year for students and seniors (age 55+) and \$5 if you live outside of the Lower Peninsula of Michigan.

This entitles you to the access to our monthly Newsletters on-line at our website and use of the 24" McMath telescope (after some training).

A hard copy of the Newsletter can be obtained with an additional \$12 annual fee to cover printing and postage. Dues can be paid at the monthly meetings or by check made out to University Lowbrow Astronomers and mailed to:

The University Lowbrow Astronomers

c/o Liz Calhoun

P.O. 4465

Ann Arbor, MI 48106

Membership in the Lowbrows can also get you a discount on these magazine subscriptions:

Sky & Telescope - \$32.95 / year

Astronomy - \$34.00 / year or \$60.00 for 2 years

For more information contact the club Treasurer. Members renewing their subscriptions are reminded to provide the renewal notice along with your check to the club Treasurer. Please make your check out to: "University Lowbrow Astronomers"

Newsletter Contributions

Members and (non-members) are encouraged to write about any astronomy related topic of interest.

Call or Email the Newsletter Editor: **Mark S Deprest (734)223-0262 or msdeprest@comcast.net** to discuss length and format. Announcements, articles and images are due by the 1st day of the month as publication is the 7th.

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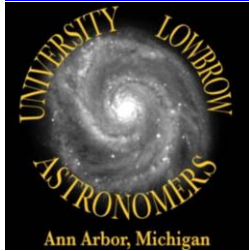


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Reflections & Refractions



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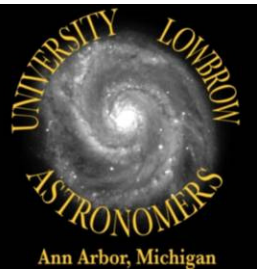


*M42 - The Orion Nebula
One Shot Color 120 second 1x1 binned
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