



VOLUME 29, NUMBER 1, WINTER 2024

PAJARITO ENVIRONMENTAL EDUCATION CENTER, LOS ALAMOS, NM

Celebrating the Night: New Mexico DarkSky Chapter Unites for the Preservation of Starry Skies

By Galen Gisler

On Friday, December 1st, sixty-odd people met in Socorro for the first statewide meeting of the newest chapter of DarkSky International: New Mexico DarkSky. They represented a broad variety of interests: tourism, land management agencies, state and national parks, environmentalism, wildlife biology, development of commercial telescope-siting facilities, and astronomy, both professional and amateur. They all had in common the goal of protecting, preserving, and improving the night skies that New Mexico is so famous for.

DarkSky International, formerly known as the International Dark-Sky Association, is a nonprofit organization formed in 1988 with the goal of protecting and preserving the nighttime environment to benefit wildlife, human health, and humanity's cultural heritage of starry skies. DarkSky International has designated over 200 International Dark Sky Places in 22 countries, including 9 in New Mexico. Our neighbor, Valles Caldera National Preserve, was designated an International Dark Sky Park in 2021, and Bandelier National Monument is updating historic light fixtures in order to apply for similar status. Chapters of DarkSky International exist in over 20 countries worldwide and in 30 states in the US. Our New Mexico DarkSky Chapter is the newest of these, formed in June 2023. We have a State Council

of 11 members spread around New Mexico, from Los Alamos (me!) to Animas in Hidalgo County in the southwest corner of the state.

Our meeting in Socorro was billed as a “stakeholders’ meeting,” and its aim was to assemble a pool of allies with varied interests in preserving dark skies. We are fortunate in New Mexico in that there are lots of places from which the Milky Way can be readily seen, and this attracts tourists and economic development. However, the danger is that economic development can quickly lead to the deterioration of this important asset.

Professional optical astronomers at Apache Point near Cloudcroft and Magdalena Ridge near Socorro continue to make leading-edge scientific discoveries; the Starfire Optical Range south of Albuquerque, LANL’s Fenton Hill Observatory, and the White Sands Missile Range also rely on dark skies for their scientific projects and their national-security missions. In the private sector, “astronomy villages” have been established in the Sacramento Mountains, in Hidalgo County, and in the Pecos Mountains. These sites rent out lots where astronomers from all over the world, professional and amateur, have placed telescopes that can be operated on-site or remotely. Generally, these sites provide their clients with high-speed internet, technical assistance, and on-site lodging when needed. Important discoveries and groundbreaking observations have been made at these sites, which collectively house several hundred telescopes.

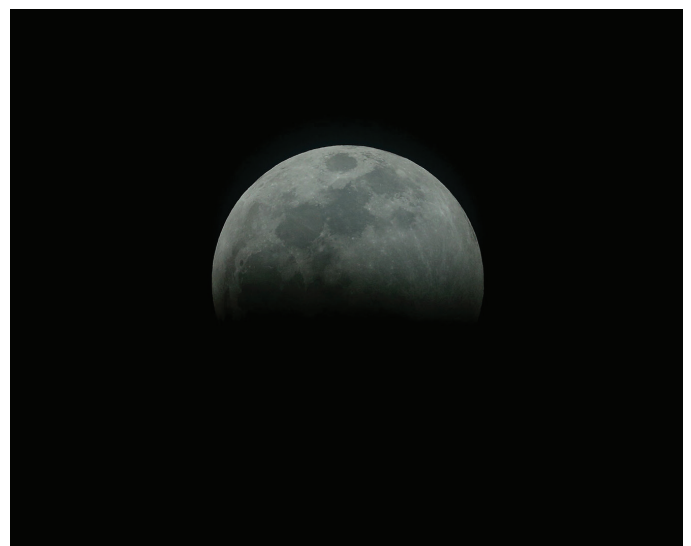
Artificial light at night is detrimental to animal species across the globe; skyglow affects navigation by migrating birds and leads to habitat avoidance, disturbance of predator-prey relationships, and mating behavior. Bird mortality through collisions with brightly lit buildings has been documented in other places, but even in New Mexico, there is evidence of reduced fitness and reproductive success. Insect populations are in decline all over the globe, which affects the web of food that all animals, including ourselves, rely on. In particular, some pollinators (moths, for example) are nocturnal and are easily distracted, as we've all seen, by lights on our buildings or illuminating our streets. These concerns were highlighted at our meeting by delegates from the Audubon Society, the Xerces Society, and the New Mexico BioPark.

Representatives from the Bureau of Land Management, from the State Lands Office, and from the New Mexico Oil and Gas Association reported on efforts their agencies were making to control the use of lighting in their domains using common-sense measures like shielding lights and turning off when not in use, particularly in response to environmental and wildlife concerns. Ruskin Hartley, executive director of DarkSky International, keyed our meeting and pointed out that New Mexico's 1999 Night Sky Protection Act (NSPA) guided the way for other states. It has become apparent, however, that this law is in sore need of an update to include modern lighting technology and a modern understanding of how light of different intensities and colors affects wildlife, human health, and the cultural heritage of the night sky—the most ancient natural resource we humans possess. Accordingly, one of the goals of our newly formed New Mexico DarkSky Chapter will be to persuade the New Mexico State Legislature to update the NSPA. The allies we are recruiting through the December meeting and subsequent statewide meetings will be key to this effort. Local lighting ordinances, like the one adopted in December 2022 by the Los Alamos County Council (whose passage was actively assisted by many of the readers of *Nature Notes*, thank you very much!), are in some respects even more important than an updated NSPA. In my talk at the meeting, I surveyed the lighting ordinances that presently exist in 33 jurisdictions around the state. Most of them are very rudimentary, mentioning shielding and adherence to the NSPA, but without quantitative guidance on illuminance limits, light trespass, and colors. Another goal of our chapter

is, therefore, to beef up local lighting ordinances to at least the standard we have set here in Los Alamos. Advocates in Santa Fe and Albuquerque are already using the Los Alamos model to construct new lighting codes for their municipalities. We have initiated discussions with people from other communities regarding similar efforts. DarkSky International is developing new templates and models for ordinances, and they are being assisted by the Illumination Engineering Society and by Clanton Associates, the Boulder, CO, lighting design firm that helped with our Los Alamos ordinance.

Education will be a clear focus as we advance, including the wide promulgation of the five basic principles of outdoor lighting (use light only if it is needed, direct light so it falls only where it is needed, control light so that it is used only when it is needed, use light no brighter than necessary, and use warm colors when possible) and regarding the deleterious effects of too much light on human health and wildlife in addition to the cultural heritage aspects. Documenting and elucidating the relationship between lighting and safety or lighting and crime is a challenging project that our chapter is also undertaking; there is a great deal of misunderstanding in this area, often presenting obstacles to the adoption of sensible lighting practices.

In sum, the first statewide meeting of the New Mexico DarkSky Chapter was a resounding success, and we look forward to future such meetings that we hope will include other constituencies, including tribal representatives and civic organizations. 🌙



A partial moon in the night sky. Photo Credit: Bob Walker.

Which Winter Bird Are YOU?

By Cathy Wise

With steamy summer days behind us, you may have noticed that your neighborhood birds have changed. Some species have migrated south to warmer climes, and other new faces have appeared to enjoy our relatively mild southwestern winters. Who are these winter arrivals, and which one are YOU most like? Take our short quiz to find out!

1. My ideal vacation

- a. Wilderness adventure with a partner or friend (1 point)
- b. A group trip to a new destination (2 points)
- c. A visit to see quaint country towns (3 points)

2. I prefer to be

- a. Alone or with my partner (1 point)
- b. Surrounded by many people (2 points)
- c. With my family, and people I know well (3 points)

3. How vocal are you?

- a. When I have something to say, it's loud and proud (1 point)
- b. I'm a chatterbox! (2 points)
- c. I am more of a dancer (3 points)

Scoring:

3-5: Common Raven

6-7: Mountain Chickadee

8-9: Evening Grosbeak

Common Raven (*Corvus corax*) <https://www.audubon.org/field-guide/bird/common-raven>

Even on the coldest, most inhospitable day, you are almost sure to spot a Common Raven. Tough, versatile, and wickedly smart, these large birds are typically found in pairs or small groups unlike, American Crows. An opportunistic feeder and found in a variety of habitats, Common Ravens come closer to town in winter to take advantage of holiday leftovers.

Mountain Chickadee (*Poecile gambeli*) <https://www.audubon.org/field-guide/bird/mountain-chickadee>

Dwelling primarily in high elevation conifer forests, the pixie-like Mountain Chickadee appears at feeders in winter to take advantage of energy-rich seeds and suet. They do not like millet, so to attract them, avoid seed mixes dominated by this inexpensive filler. Typically found in flocks, Mountain Chickadees forage actively in trees, and during insect outbreaks, are credited with removing unwanted pests. One pint-sized bird was observed to eat over 200 pine-destroying caterpillars in a day!

Evening Grosbeak (*Coccothraustes vespertinus*) <https://www.audubon.org/field-guide/bird/evening-grosbeak>

A stunning and substantial bird, the appearance of this forest-dweller at feeders truly heralds winter. Males sport kingly yellow eyebrows and are unmistakable. Females, although less flashy, are demurely beautiful, making flocks interesting to watch. As their large bill suggests, they are primarily a seed-eating species but will eat fruit, berries, and budding leaves. In courtship, the male will dance with the female with tail raised, and both male and female bow to each other.

Regardless of your quiz outcome, there are plenty more winter birds to discover. Join PEEC Saturday, March 23rd for an early spring bird walk! If you have ever wondered what birds you see around the Pajarito Plateau, this is an excellent opportunity to find out. These walks are perfect for people who already enjoy birding and for those who are just beginning or simply curious. For more information, visit [pecnature.org/events](https://www.pecnature.org/events).



Book Review: *An Immense World: How Animal Senses Reveal the Hidden Realms around Us*

By Ed Santiago

"What IS she smelling??" Those of you with dogs or who have ever walked a dog, you're nodding right now. You've felt that "oof!" as you're yanked back in your tracks. You've watched that intent high-speed sniffing of a leaf that, to our eyes, is indistinguishable from any other nearby leaf. As you patiently stand there, you've wondered what they're sensing.

There is so much going on around us, and we're oblivious to all but a tiny fraction of it. Our senses are remarkable, but so are those of other creatures who perceive the world through smell, sound, touch, heat, electricity, and, most mysterious of all, magnetic fields.

In *An Immense World: How Animal Senses Reveal the Hidden Realms Around Us*, science writer Ed Yong gives us exquisite glimpses into the ways that other animals interact with the world. He does so in a way that makes them relatable, asking us to stretch our imaginations and our empathy. In each of the eleven chapters, he describes one sensory mechanism and how different animals have evolved to make use of it. You read that right: eleven senses. Even if you quibble with his decision to separate light detection from color vision, a decision I'm OK with after reading his argument, it's still humbling to learn how many ways there are to thrive on this planet. And to know that all around us are signals we can't even detect.

Yong's tone is graceful and compassionate. He wants us to feel, not learn, wavelengths or numbers of neurons. There are charts (three, each one helpful), illustrations, and two inserts filled with breathtaking color photos. There are footnotes, often lighthearted and sometimes thought-provoking. This is a book best enjoyed in print, not audio or ebook.

Reading this book has changed the way I walk. Now, when I hear a nuthatch, I stop to think about the rich parts of their song that are beyond my hearing. When seeing a spiderweb, I see its motion in the wind and remember that its creator is feeling delicate vibrations. Watching otters frolic in the Guaje Canyon stream, I marvel at what their whiskers

tell them about the clams below. And, of course, dogs; each stop is now a lesson in wonder.

But that other question—how can a ten-pound dog halt a "two-hundred-pound leash-holding ape?" The best scientific labs in the world have never been able to answer that. 🐾

[*One Los Alamos is a local group promoting thoughtful, civil dialogue around our diversity of backgrounds, beliefs, and identities in order to champion shared values and interests that can strengthen our community.* <https://linktr.ee/OneLosAlamos>]

Winter Night on the Pajarito Plateau

By Marilyn Lisowski

The canyons cutting into the Pajarito Plateau lie deserted in the silent slumber of deep winter's peace. Snow blankets the rocky slopes and glistens in bright starlight. Hibernating animals are the lucky ones. Others must endure the frigid months and find enough food or perish.

Half a mile away, a doe nestled behind boulders and brush with her sisters and youngsters raises her head, testing the air. The breeze coming down the canyon is clear of scent, and the only sound is the hoot of a great horned owl calling its mate. She rises, determined to feed. Her two half-grown fawns murmur and lift their bodies next to their mother. Her sisters snuggle closer together and sleep once more. The doe picks her way out of the warm hiding place and down the slope onto a narrow path. Her fawns follow her careful footsteps.

A gray fox, heedless of the cold with his thick fur, slinks soundlessly through the snow from his burrow. Hunger pains assail him, and he savors the thought of a hibernating mouse, a hidden squirrel, or a careless rabbit. His mate needs food, too. She doesn't complain, but he knows the kit embryos in her belly must have it.

In a pack of three, the lead coyote signals the others to enter and hunt up a canyon they know well. They have devoured tasty mammals in this canyon, and they are ravenous.

A flash of snow on fur slides among rocks towards the canyon bottom—a famished mountain lion. Her kittens whimper, their tummies aching. Mercifully, they doze on. She sniffs the air and pricks up her pointed ears.

Deer! More than one. Like silk, she glides along the canyon's rise, towards skeletal aspen. She creeps closer; the scent is stronger now.

The fox hears the faint breaking of twigs and moves stealthily towards the sound. The three coyotes halt to test the air. The scent of deer floats unmistakably in the breeze. Carefully, they move upwards. Suddenly, they freeze. Mountain lion! Apex predator. They cannot risk it. She would slash one or more of them to shreds. Silently, the three retrace their steps. The mountain lion closes in on the ripping of aspen bark and spots the doe and fawns.

The deer catch her scent and leap to flee. The mountain lion sprints but misses the doe. The fawns, terrified, scatter, one straight towards the retreating pack of coyotes. The coyotes bound to surround it, but the fawn is too smart. It plunges straight under the legs of the nearest coyote and dives into rock cover. The other races down the canyon, into leafless bushes, and freezes still. The echo of tiny hooves alerts the rabbit, and it spins around suddenly, facing the fox. The rabbit dashes off in semi-circles to confuse the fox, but the fox is nearly upon it. The rabbit, in desperation, dives under a low rock ledge. The fox is fast, but not fast enough. He jams his fangs uselessly towards the rabbit's cottontail. He digs a hole behind the rabbit to reach farther. The rabbit trembles violently. The digging opens a tiny burrow of hibernating voles, confused and lethargic. The fox snaps up two of them and backs out of the hole.

The coyotes howl at their loss. The mountain lion creeps close to the unhappy beasts. She vaults onto the nearest, bites its neck, and drags it, lifeless, towards the canyon bottom. The remaining coyotes growl, bare their teeth, and slip away. The mountain lion dines on tough flesh. Coyote is not her favorite meal, but it's better than letting her kittens die. She rips off a thigh for them before burying the carcass in the snow to freeze and save, masking the scent. Back in her den, the kittens feast hungrily on the thigh. The deer return to the aspen. The two gray foxes fill their bellies and sink into contented slumber.

In winter, mammals must hunt for scarce food and be hunted. For now, though, silence sinks into the canyon and spreads to the Pajarito Plateau—the stillness of deep winter's peace. 🦋

Languorous, You Say

By David Fox

The snow hung languorous.

Elongated frigid shapely lobes and dollops.
Sumptuous marshmallows of the stuff
Warmed more than just limb deep
Over the glow of hot red coals.

Arranged as by subtle hands.
Angelic softened white shaded tones
Where the sun
Had not yet shone that morning
After the all-night snows.

Fresh as purity itself
Frost now glittering absently.
Sun on the rise.

Shapely loads of them.
Hanging as by previous plan,
On the nodding bows
Of the heavenly pines
Of the frozen season.

Pine after pine of Angelic languors
Set this scene with intention
Sculpted, brushed with cashmere,
Strewn in snowy forests.
Frozen suspension,

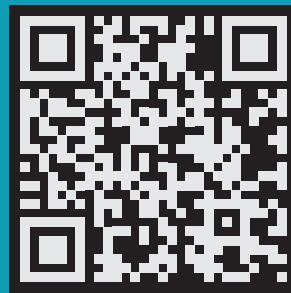
Patient as purity.

Adorned
For the Sun. 🦋

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for YOUR
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Meet PEEC's New Staff/Board!

The start of a new year is a wonderful time to reflect on past successes and look forward to what's to come. Over the past year, the PEEC community continued to grow and provide unwavering support. Here is a quick update on the work you made possible in 2023:

You helped more than **37,000** people across north-central New Mexico connect to the joy and wonder of nature. This includes **10,000** public program participants, **12,000** nature center visitors, and, **100+** volunteers contributing over **6,000** hours of volunteer service to PEEC.

2024 promises to be another great year for PEEC! Please help me welcome our new staff and board, and accept my gratitude for you and the difference you've made.

Jillian Rubio, Executive Director

Izza Bello, Early Childhood Educator



Born in a rural part of Chiapas, Mexico then growing up in the inner city of Los Angeles, Izza always felt calm nearest the few trees that were around. It was not until she went on her first hike, at the age of 21, that she finally felt like she belonged. The first in her family to graduate high school and go to college, she is currently enrolled at UNM for Special Education with a Spanish Endorsement. Izza enjoys hiking, camping, and rock climbing with her son, partner, and two pups. In her spare time, she has begun wood carving and wood printing and is excited about making art. She started working at PEEC in October 2023.

Sarah VanHoosier, Environmental



Sarah grew up in Indiana and got quite the change in scenery when she moved to New Mexico. Her passion for the outdoors began at a young age and persisted into her adult life. She has previously worked as a state park naturalist and a camp counselor. She graduated from Indiana University with a BS in Environmental Health. Sarah enjoys hiking, caving, and exploring new places. She joined the PEEC staff in November 2023.

Trey Pereyra, Board Member



Trey, a Los Alamos native, immerses himself in the scenic canyons and trails of his childhood. Committed to community service, he served on the Parks and Recreation Board and Personnel Board in Los Alamos. He is currently an HR Analyst for Los Alamos County and holds leadership roles in the Los Alamos Educators Union and AFT-NM. Trey joined the PEEC Board in October 2023.

New Programs on Basics of Astronomy

Have you ever wanted to explore astronomy but sometimes find it overwhelming? Join us in the Los Alamos Nature Center planetarium in January for a Basics of Astronomy series. Our planetarium educator, Elizabeth Watts, will take you on a tour of the solar system, the galaxy, and the universe. The series will conclude with an "Ask the Astronomer" session!

The first program will start on Earth, looking up at the constellations and exploring stories from around the world about the night sky. We will travel to the southern hemisphere to see changes in the sky. We will also talk about different observatories worldwide and what people learned about the skies before there were telescopes.

The second program will explore the solar system and how much we do and do not know about our own local planets. We will discuss some current and upcoming NASA missions and local connections to these.

The third week will expand from our solar system to the Milky Way and galaxies beyond. We will use the planetarium to get an idea of the scale of the universe and the distribution of galaxies. We will also look at how the Webb space telescope is increasing our knowledge of space, both inside our solar system and out to the Big Bang;

The final week will conclude with a panel of astronomers to answer your hard questions. Try to stump them if you can! Weather permitting, we will also go outside and use a telescope to observe the night sky.

Everyone is welcome to come to one or all the programs. You will not need to have attended the first class to understand the following ones. This will be an interactive program with the audience, aimed at ages 8+. For registration, please visit peechnature.org/events. Please contact Elizabeth at elizabeth@peechnature.org if you have any questions.

Our Mission: Enriching people's lives by strengthening their connections to our canyons, mesas, mountains, and skies.

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"If you have the time, go. It's free to enter and gives you insight into the environment and animals around the area..."

— Los Alamos Nature Center visitor

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Wednesday: 10 – 4
Thursday: 10 – 4
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Saturday: 10 – 4
Sunday: Closed

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Because of YOU, PEEC helps ensure that people of all ages experience the joy and wonder of nature. Photo Credit: Jillian Rubio

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UPCOMING EVENTS

Backcountry Film Festival **JANUARY 24**

Fulldome Film: One Sky Project **FEBRUARY 10**

Cloudspotting **MARCH 7**

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