



AU AstroNews

The Newsletter of the Astronomical Unit

December 2023

Sponsored by the Santa Barbara Museum of Natural History



"That's right. There's even more loot out front. Some guy in a Santa hat with a group of reindeer was apparently pulled over by the police for sleighing without a license." Photo credit: Tom Totton.

OUTREACH SUMMARY

SBAU volunteers must have undergone the SBMNH background check, and conform with the SBMNH policies for dealing with the public, to participate in outreach activities. To get vetted, contact SBMNH Volunteer Manager Rebecca Coulter <rcoulter@sbnature2.org>. It's quick and painless.

Since the last newsletter, certified SBAU/SBMNH volunteers Brandy Ackerman, Krissie Cook, Tim Crawford, Ron Herron, Sean Kelly, Stephen Faulstich, Tessa Flanagan & Duff Kennedy, David Larson, Pat & Chuck McPartlin, Janet & Martin Meza, Bonnie & Bruce Murdock, Edgar Ocampo, Charles Schueler, Tom Totton, Tom Whittemore, Jerry Wilson, John Winckowski & Sean Fox & Quasars, and Andre Yew showed the sky to **731** guests. Ken Kihlstrom, Jen Ito, and David Feinberg also helped out.

OUTREACH EVENTS

FRIDAY, DECEMBER 1, 7 PM

Quick planetarium show, then at 7:30, our monthly meeting in Fleischmann Auditorium at SBMNH. This will be a hybrid meeting, also on Zoom. Watch your email or find the link on the SBAU web page. This meeting will feature our annual election, followed by a Members' Night set of informative and entertaining speakers. Tonight we will hear from three members about their favorite topics: David Feinberg will talk about meteorites and tektites; Mike Hardwick will discuss astrophotography, and Rex Meach's talk is titled "Celestial Navigation Oversimplified."

SATURDAY, DECEMBER 9, 5 PM

AU monthly planning meeting on Zoom. Watch your email for the link.

SATURDAY, DECEMBER 9, SETUP 6 PM

Monthly Public Star Party at SBMNH, at Palmer Observatory from 7 to 10 PM.

TUESDAY-WEDNESDAY, DECEMBER 13-14

Peak of the Geminid Meteor Shower overnight. Best after midnight.

FRIDAY, DECEMBER 15, SETUP 6 PM

Monthly Public Telescope Night at Westmont, at their Keck Observatory, next to the athletic fields.

WEDNESDAY, DECEMBER 21, 7:27 PM

Winter Solstice for the northern hemisphere.

TUESDAY, DECEMBER 26, SETUP 7 PM

Telescope Tuesday at Camino Real Marketplace, in the plaza by the theater. **For 2024, Telescope Tuesday will shift to the second Tuesday of each month.**

FROM THE PRESIDENT

Jerry Wilson

For decades, dark matter and its elusive nature have baffled physicists and astronomers alike. The prevailing theory envisioned dark matter as a simple, lightweight particle (like Axions) diffused throughout the universe. Recent research, however, challenges this notion and proposes a rather unique idea: the universe might have created [dark matter](#) within the first moments of the Big Bang. They delve into a concept termed "recycled dark matter." This novel mechanism introduces the possibility that ultra-heavy dark matter (UHDM) particles were generated in the aftermath of the early universe's phase transitions before the classic Big Bang. The researchers, from Cornell University, propose that these particles got entangled in [ultra-dense pockets](#), leading to the formation of black holes and eventually evolving into a diverse array of dark matter species.

During the early universe's phase transitions, we know today that a single unified force was transformed into the four fundamental forces: gravity, the weak force, electromagnetism, and the strong force. The team notes that ultra-heavy dark matter could get trapped in pockets during these transitions, with some pockets having made the transition while others had not, triggering the collapse into [black holes](#).

These black holes then undergo "Hawking Radiation," gradually evaporating and releasing a shower of new dark matter particles before they die or recycle dark matter. According to the team's model, the earlier dark weight was lighter. The theory further suggests that the death of these black holes limits the total amount of dark matter in the universe. Like normal matter, dark matter is composed of different materials, leading to a "dark matter periodic table." While recycled dark matter remains speculative and largely theoretical, it provides a refreshing perspective on the enigmatic substance that constitutes a significant portion of the universe.

Experimental evidence supporting this theory is still a long way away, but finding any would be accelerated by directly detecting one or more dark matter particle species. Attempts to recreate [gravitational waves](#) and search for dark matter are well underway.

ARTS CORNER

"The Season of Sleeping"

(Taken from "The Comfort of Crows: A Backyard Year" by Margaret Renkl)

When I was young, I craved the expansiveness of heat, the languor of an afternoon so hot the only choice was stillness. I longed for the light and color, impatient for the goldfinch to put on his yellow finery, for the hardwood trees to shiver into green.

Age has given me an internal source of warmth, and hubris has given us all a burning planet, but I still love the seasons of light and color. Only when I head outside do winter's consolations become clear. The small group of birds rustling in the leaf litter are suddenly visible. I can tell the song sparrows from the field sparrows, and the Carolina wrens from the winter wrens. The contours of the earth emerge, fold upon fold, as though I had been seeing before in only two dimensions. On the lake trail, I turn toward the belted kingfisher's rattling call, and there is the kingfisher himself, his shaggy crest scraping the blue sky from a branch high in the trees.

Nothing in nature exists as a metaphor, but human beings are reckless metaphor makers anyway, and only a fool could fail to find the lesson here. The cold roots of the sleeping trees along the streambed are even now taking in water. One day soon that water will rise and spring into the world in a rush of tight green leaves poised to unfurl. Everything that waits is also preparing itself to move.

"Falling a Little Bit in Love With the Dark"

(by Margaret Renkl - excerpted from the December 21, 2022 NYT)

This year the winter solstice arrives on Dec. 21 in the shank of the dark afternoon. Officially the first day of astronomical winter, the solstice is better known as the shortest day of the year. I prefer to think of it as the longest night of the year, for I am making friends with the darkness.

For most of my life, I looked forward to the solstice because it signals a shift to longer days. I was never a fan of winter, and earlier sunrises and later sunsets always felt to me as a kind of compensation for the cold. But my heart has been thawing these past years, watching as winter becomes ever more

fragile, its cold imperiled by the changing climate, its darkness by our own foolishness and fear.

With the arrival of LED lighting, which costs so little to burn, every house has become an island of illumination, every city a blazing forest fire of artificial light. In my own backyard, it's hard to enjoy the full moon because so many of our neighbors now leave their lights on all night long. And that's without the holiday displays, each one bright enough to guide an airplane from the sky and land it safely in the middle of our street.

This resolve to snuff out every shadow of night – I wonder how closely it might be linked to the metaphorical darkness of our age. Discord, suffering and sorrow are everywhere, all much darker than any winter night, and tilting Earth is not to blame for them. It's not hard to understand what's really to blame: Media and political figures alike profit when we are angry or afraid.

Literal darkness is simple by comparison, but people inclined to flood their own yards with light for safety's sake seem not to know how little safety they've provided themselves or what measures of actual safety they have closed off in the attempt. They will never know what dangers might lurk beyond their own little circle of light because they've created the very circumstances that prevent their eyes from adjusting to darkness.



Tim Crawford shows off the early stages in the design of his 8" Dobsonian. Photo credit: Tom Totton.

AU Information Box

President: Jerry Wilson 252-2206
jerryawilsonphd@gmail.com

Vice President: Ron Herron
vicepresident@sbau.org

Secretary: Pat&Chuck McPartlin 964-8201
secretary@sbau.org

Treasurer: Colin Taylor 967-8140
dancingmagpie@cox.net

Equipment: Tom Totton 562-8795
equipment@sbau.org

Outreach: Chuck McPartlin 964-8201
outreach@sbau.org

Newsletter: Tom Whittemore 687-2025
kometes@aol.com

Webmaster: Tom Totton 562-8795
webmaster@sbau.org

Merch Manager: Pat McPartlin 964-8201
parsnip7@yahoo.com

SBMNH Astronomy Programs Manager

John Winckowski 682-4711 ext. 164
jwinckowski@sbnature2.org

AU AstroNews, the monthly publication of the **Astronomical Unit (AU)**, is mailed to the AU membership. For publishing consideration for the next month, submit astronomical items by the 20th of the current month!

AU annual membership rate: \$20

AU mailing address:

Astronomical Unit
c/o Santa Barbara Museum of Natural History
2559 Puesta Del Sol Road
Santa Barbara, CA 93105-2998

On the Web: <http://www.sbau.org/>

The Astronomical Unit

c/o Santa Barbara Museum of Natural History
 2559 Puesta Del Sol Road
 Santa Barbara, CA 93105-2998

DECEMBER 2023

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1 "HYBRID" AU MONTHLY MEETING 7PM	2
3	4 LQ MOON	5	6	7	8	9 ZOOM PLANNING MEETING 5PM STAR PARTY 6PM
10	11	12 NEW MOON	13 GEMINID METEOR SHOWER	14 GEMINID METEOR SHOWER	15 WESTMONT PUBLIC STAR PARTY 6PM	16
17	18	19 FQ MOON	20	21 WINTER SOLSTICE	22	23
24	25	26 FULL MOON "TELESCOPE TUESDAY" AT CAMINO REAL MARKETPLACE 7PM	27	28	29	30
31						