



AU AstroNews

The Newsletter of the Astronomical Unit

December 2022

Sponsored by the Santa Barbara Museum of Natural History



UCSB's "Physics Circus" sets up demos at Hope School's STEAM night. Photo credit: Tom Totton.

IN-PERSON MEETING RETURNS!

Our December monthly meeting will be held in Farrand Auditorium at the Museum, starting at 7 PM with an introductory planetarium show, followed at 7:30 PM with a hybrid meeting. Attend in person, or tune in from home to a Zoom webinar at the following link:

<https://us06web.zoom.us/j/81993023418?pwd=a3dlS09WWHJ0TWd2ek42aU5yamxoQT09>

Meeting ID: 819 9302 3418

Passcode: 284657

This meeting will feature our annual election. If you are interested in serving as an officer in the club, contact Vice President Ron Herron at [<brherron@gmail.com>](mailto:brherron@gmail.com) Positions and their duties are detailed on the SBAU web page.

Following the election, we'll have a Members' Night set of informative and entertaining speakers. Jerry Wilson will detail the recent design and construction of his backyard observatory, and Ron Herron will pose astronomical questions he's always wanted to ask.

AU HOLIDAY PARTY

Celebrate the Winter Solstice with a potluck at the MacVeagh House at SBMNH, starting at 3 PM on Wednesday, December 21! (May or may not happen – stay tuned.)

THE MOON OCCULTS MARS

The Moon will pass in front of Mars from our point of view on the evening of Wednesday, December 7, vanishing behind the eastern edge of the Moon around 6:30 PM PST, and emerging again on the opposite side an hour later.

OUTREACH SUMMARY

To get full outreach credit, SBAU volunteers must be fully vaccinated and boosted, and have undergone the SBMNH background check to participate in outreach activities. To get vetted, contact SBMNH Volunteer Manager Rebecca Coulter [<rcoulter@sbnature2.org>](mailto:rcoulter@sbnature2.org). It's quick and painless.

Because we operate under the auspices of the Santa Barbara Museum of Natural History for our outreach events, we are obligated to conform to their requirements for dealing with the public. This means completing the Museum's background checks and vaccination requirements, and adhering to their standards of conduct. AU members who show up at outreaches that have not fulfilled these requirements are not allowed to present themselves as representatives of the AU, nor to interact with children.

Since the last newsletter, certified SBAU/SBMNH volunteers Brandy Ackerman, Krissie Cook and Quasars and Girl Scouts, Raf Cottom, Tim Crawford, Joe Doyle, Sean Fox, Sean Kelly, Tessa Flanagan, Pat & Chuck McPartlin, Janet & Martin Meza, Javier Rivera, Charles Schueler, Tom Totton, Tom Whittemore, and Andre Yew showed the sky to 1005 guests. Ken Kihlstrom also helped out.

OUTREACH EVENTS

FRIDAY, DECEMBER 2, 7 PM

Monthly AU meetings return to Farrand Auditorium at SBMNH!

TUESDAY, DECEMBER 6, SETUP 7 PM

Telescope Tuesday at Camino Real Marketplace, in the plaza by the theater. For 2023, Telescope Tuesday will shift to the fourth Tuesday of each month.

WEDNESDAY, DECEMBER 7, 6:30 - 7:30 PM

Moon occults Mars!

SATURDAY, DECEMBER 10, 5 PM

AU planning meeting outside Palmer Observatory at SBMNH.

SATURDAY, DECEMBER 10, 7 PM

Monthly Public Star Party at SBMNH, at Palmer Observatory.

WEDNESDAY, DECEMBER 14, 5 AM

Peak of the Geminid Meteor Shower, but with a gibbous Moon. Maybe better viewed on Tuesday evening before moonrise.

THURSDAY, DECEMBER 15, SETUP 5 PM

Telescopes for Peabody Charter School, 3018 Calle Noguera. We enter through a gate on the SW side of campus, off Calle Granada.

FRIDAY, DECEMBER 16, SETUP 6 PM

Monthly Public Telescope Night at Westmont, at their Keck Observatory, next to the athletic fields. The new security gate at the Cold Spring entrance is manned from 7 AM to 7 PM. SBAU members and public attendees arriving after 7 PM will have to enter through the main entrance off La Paz Road.

WEDNESDAY, DECEMBER 21, 1:48 PM

Winter Solstice for the Northern Hemisphere

WEDNESDAY, DECEMBER 21, 3 PM?

AU Holiday Party, a potluck, at the MacVeagh House next to Palmer Observatory at SBMNH?



“That’s right. These four clowns followed me here. They said they would release me for a box of See’s Candies. Do you have any?” Photo credit: Tom Totton.

FROM THE PRESIDENT

Jerry Wilson

What is your weight? What is your mass? Unless you’ve taken a science course you probably don’t think anything about these words, unless, of course, you’re trying to diet. However, we live in a time when humanity is stepping out into space and questions of mass and weight often crop up in news programs and Hollywood movies. Science illiteracy is so common in our country that news outlets, movies, and even lectures pass on confusing misconceptions. They embody simple but subtle errors and lead to confusion as to what an orbit, or even what a gravitational field actually is.

Mass is an intrinsic property of all matter. The same person standing on Earth, Mars, or floating a million miles out in space has the same mass. It doesn’t matter where you are or what’s happening to you, your mass is constant, more or less. It does change slightly when you eat or diet, but that’s not the point.

Weight is a force, and measures how strongly your mass is attracted to other masses. A person standing on the Earth will have a

certain weight, measured by a bathroom scale. On the Earth, gravity pulls us down, but the Earth's surface does not yield and our body perceives this resistance as our weight.

If, however, you take an elevator up to the roof of a building and jump off, then, while you are falling, you have no weight, you are in free fall. You become weightless, but not massless. At least you are weightless until you hit the ground. By the same token, you are weightless from when you jump off a diving board until you enter the water.

A famous NASA airplane, affectionately called the vomit comet, is used to let astronauts get used to weightlessness. It does not become weightless because of its altitude. It is weightless because of the path it flies. The plane dives at the same rate the passengers fall.

When you are in orbit around the Earth you are also weightless, because you are in free fall. So why doesn't the free-fall of an orbit end the same ugly way as free-fall from some building? The reason, of course, is because you never hit the ground. An orbit is not just falling, it is falling down, but at the same time you have a 17,500 mile per hour sideways motion.

If you are at 200 miles from the surface, and you jump out from a stationary position, with no sideways motion, you will fall straight down and end up like the roof jumper. Now, if you're at that same height (200 miles above Earth's surface), and moving tangentially at 17,500 mph, you will miss the earth. You will maintain a curved path. Unless you lose energy, you will circle Earth forever. If your tangential motion is too slow you will eventually descend and ultimately land on Earth. On the other hand, if you travel faster than 17,500 mph you will climb into a larger

orbit. Or drift into space, never to be seen again.

It is important to realize that you are weightless in orbit because you are falling. You are not weightless because you are above Earth's gravity. Even for our 200 mile orbit, Earth's gravitational pull is still considerable! It is also important to know that you cannot get above Earth's gravity. Although Earth's pull weakens according to the inverse-square law, it still extends all the way to infinity.



"Excuse me. Anybody here fluent in Zarkon?" Photo credit: Tom Totton.



"That's right. Where I come from, we count in base 5." Photo credit: Tom Totton.

ARTS CORNER

Be a Weed

by Margaret Renkl (excerpted from "Late Migrations")

Sometimes, when I haven't slept or the news of the world, already bad, suddenly becomes much worse, the weight of belonging here is a heaviness I can't shake. But then I think of the glister of a particular morning in springtime. I think of standing in the sunshine and watering the butterfly garden, which is mostly cultivated weeds punctuated by the uncultivated kind that come back despite my pinching and tugging. I think of the caterpillars on the milkweed plants, unperturbed by the overspray, and the resident red-tailed hawk gliding overhead, chased by a mockingbird and three angry crows, and the bluebird standing on the top of the nest box protecting his mate, who is inside laying an egg. I think of that morning, not even an hour – and I say to myself, Be an egg. Be a mockingbird. Be a weed.



"Not a bad one, Mike. Did you hear the one about the alien who fell in love with a refrigerator magnet?" Photo credit: Tom Totton.

AU Information Box

President: Jerry Wilson 968-4056
jerryawilsonphd@gmail.com

Vice President: Ron Herron
vicepresident@sbau.org

Secretary: Colin Taylor
dancingmagpie@cox.net

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

Equipment: Art Harris 968-4017
n6is@cox.net

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 Specialist

Krissie Cook 682-4711 ext. 164
kcook@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 rates:
Single = \$20 Family = \$25

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 2022

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 "HYBRID" AU MONTHLY MEETING 7 PM	3
4	5	6 CAMINO REAL MARKETPLACE 7PM	7 FULL MOON MOON OCCULTS MARS 6:30-7:30	8	9	10 PLANNING MEETING 5PM STAR PARTY 7PM
11	12	13	14 GEMINID METEOR SHOWER 5AM	15 LQ MOON PEABODY CHARTER SCHOOL 5PM	16 WESTMONT PUBLIC STAR PARTY 6PM	17
18	19	20	21 WINTER SOLSTICE 1:48PM POTLUCK 3PM?	22	23 NEW MOON	24
25	26	27	28	29	30 FQ MOON	31