



AU AstroNews

The Newsletter of the Astronomical Unit

June 2021

Sponsored by the Santa Barbara Museum of Natural History



Two Ritz-Carlton guests pose before a club outreach. Photo credit: Tom Totton.

OUTREACH SUMMARY

Because of the waning pandemic, there was no in-person public telescope outreach in May. Get vaccinated, then stay safe and healthy by wearing masks when necessary, washing your hands frequently, and practicing physical distancing. Like astronomy, things are looking up!

OUTREACH EVENTS

The SBAU radio hour has been replaced by a weekly Zoom/YouTube Live event every Monday at 11 AM. If you watch, the Live video should be able to take comments and questions in its Chat area: <https://tinyurl.com/2vss2yam>

For June, there will be no SBAU meetings or in-person public telescope outreach. We are tentatively restarting the slide show portion of the Cachuma Lake outreaches, with an event at 8:30 PM on Saturday, June 19.

THE JUNE SKY

The International Space Station will be making some bright visible passes through our evening skies in the first week of June, June Gloom permitting. Its orbit may change from time to time,

so to get the latest and most complete predictions, visit Heavens Above <https://tinyurl.com/y5yt22ch>

On Tuesday, June 1, the ISS will have its brightest pass of this sequence, rising at 9:54 PM PDT in the NW between Auriga and Gemini, cruise through the dim constellations Lynx, Leo Minor, Canes Venatici, and Coma Berenices before vanishing in the Earth's shadow high overhead near bright orange Arcturus at 9:57 PM.

On Wednesday, it will start in the NW at 9:07 PM near Capella, go along the bowl of the Little Dipper asterism, along the upper side of the Keystone asterism in Hercules, and fade out in the ESE in Ophiuchus at 9:12 PM.

Thursday's pass will rise at 9:56 PM in the WNW by Gemini and Mars, and trace much of the length of dim Hydra before disappearing in the SW at 9:59 PM as it reaches Crater.

On Friday, the station will rise at 9:09 PM in the WNW, pass above brilliant Venus and dim Mars, then across Gemini and Cancer to go below Regulus and through Corvus to set in Centaurus in the SSE at 9:14 PM.

The last pass of this sequence will be on Sunday, when the ISS will appear at 9:13 PM in the WSW to take a low path under the length of Hydra to set in the SSW at 9:15 PM.

The ISS will transition into our morning sky for the last week of June, and be back in our evening sky by the second week of July.

June will be a quiet month for us for sky events as we transition toward the summer sky. It's still good galaxy hunting time, but the globular clusters and nebulae of summer will be starting to climb up in the east.

On June 17, asteroid 4 Vesta, the second largest asteroid, will be at its brightest for the year at 7th magnitude, visible in binoculars.

At 8:32 PM PDT on Sunday, June 20, summer will officially arrive with the solstice.

Mars will be in the Beehive Cluster (M44) on June 23, and for the next two evenings Venus will be forming a nice horizontal line with Castor and Pollux in the west after sunset.

FROM THE PRESIDENT

Jerry Wilson

Every single macroscopic object in the universe represents a balance between two opposing forces. One (gravity) trying to squeeze the object together and one of a progression of opposing forces. A rock, as you might pick up on a hike, is a small irregular object with its shape determined largely by molecular bonding, self gravitational forces do not significantly define its shape

This continues for increasing mass until the object is in the range of 600 miles in diameter. For example, Ceres. Here gravity is sufficient to pull the object into a sphere. More or less. It is the inherent strength of the molecules and atoms that resist the gravitational pull to collapse.

Larger bodies of this class, such as Jupiter, do compress a bit, with the compression heating the interior through internal friction. When the body is large enough that the internal heating raises the core temperature to at least 10 million degrees, nuclear fusion begins and the emitted energy becomes the dominant force resisting gravitational collapse.

The next step is represented by a white dwarf star. All the hydrogen has been burned so that a white dwarf is accurately modeled as a degenerate relativistic electron gas held gravitationally by a core of ionized helium nuclei. The key word here is degenerate. When two electrons (fermions) occupy the same energy state they are said to be degenerate. The Pauli exclusion principle prevents this from happening and provides the resistive force for gravitational collapse. Here all the electrons have been scrunched into one star-wide state, the ground state. No more fusion is going on and the star shines dimly using up its last reserve of compressional heating.

But if the mass is bigger gravity pushes all the electrons into the He, or heavier elements depending on how far towards iron the fusion went. The electron is compressed into the proton producing a star that is all neutrons. It takes a lot of gravitational compression to force an electron into a proton. This is the force that keeps a neutron star from collapsing beyond its event horizon. If the mass is bigger yet, then the whole thing compresses into a black hole. So the question becomes: is there another source to interfere with complete collapse, but we just can't see it because the mass is inside the event horizon, or is the way finally clear to a singularity? There are many more elementary particles that like to stay apart, so I think a singularity is a cop out.

ARTS CORNER

Tree Frog

Ted Kooser

Late evening, a velvety black
beyond the high windows, and on one
a tiny tree frog with its legs spread
presses its soft, white belly to the glass.
This night it gets to be the evening star.

Up the Block

Ted Kooser

Maybe you saw me pass by, walking,
or maybe you didn't. I raised a hand
in a tentative wave, but you were intent
upon your watering, as if to make sure
the spray from the hose fell evenly
over your small plot of petunias, purple,
pink, and white. The nozzle was yellow,
of plastic, much like a showerhead,
sweeping or brushing the bright drops
evenly, lacquering over the flowers,
the dark purple ones deeper in color
under the layer of glazes, and the pink
brighter, too. The white looked the same,
but you'd probably planted those there
mostly to set off the others. From one end
to the other you slowly and gently
swept the soft whiskbroom of droplets,
enrapt, or so it appeared, by what
you saw sprinkling out of your hand,
upon which I could see drops forming,
each diamond-bright on a knuckle,
and I guessed they were cold, perhaps
even numbing, but you'd gotten hold
of a rainbow, and couldn't let go.

A Moth, a Moon

Ted Kooser

I watched a moth fly round and round the moon,
or so it seemed as I stood looking up.

More than two hundred thousand miles away,
the moon was small, and full, and very bright

Like a lightbulb over a neighbor's door.
The moth was the size of a moth, but next to

the faraway moon it looked big, like a satellite
orbiting, held in place by the moon like a moth

by the glow of a bulb, and it seemed to be
spanking the face of the moon with its wings

the way that a moth will spank a lightbulb.
The explanation, of course, was that the moth

had chosen to fly round an invisible spot
directly between where I stood and the moon...

Although maybe not, maybe the moon I could see
wasn't our everyday moon, far off in the stars,

but another, smaller one, and this little moon
was the size of a cabbage, magically floating

over my house, wrinkly and pale like a cabbage,
for the moth had a cabbage moth's whiteness,
and flew in and out of the light like a star.

AMATEUR RADIO ASTRONOMY

For its 75th anniversary, the Astronomical League produced a series of videos highlighting various aspects of amateur astronomy. SBAU member Jiri Polivka, who is now living in Missouri, is an avid amateur radio astronomer, and has produced kits using readily available materials to construct small radio telescopes. He was featured in this video: <https://www.youtube.com/watch?v=6c-4jVLnRDo>

IN MEMORIAM

We are sad to report the passing of Douglas Bryson. A member of the Santa Barbara Star Cluster – a local astronomy club founded in the 1950s, Doug

was the proprietor of Douglas Telescopes, an optical supply house in downtown Santa Barbara where many amateur astronomers found inspiration for their hobby. Doug passed away at the age of 92.

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June 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2 LQ MOON	3	4	5
6	7	8	9	10 NEW MOON	11	12
13	14	15	16	17 FQ MOON VESTA BRIGHTEST	18	19 CACHUMA LAKE SLIDE SHOW
20 SUMMER ARRIVES	21	22	23 MARS IN THE BEEHIVE	24 FULL MOON VENUS, CASTOR, POLLUX LINE	25 VENUS, CASTOR, POLLUX LINE	26
27	28	29	30			