



AU AstroNews

The Newsletter of the Astronomical Unit

July 2017

Sponsored by the Santa Barbara Museum of Natural History



“Who left the door open and let these monsters in?!” Photo credit: Tom Totton.

THE JULY GENERAL MEETING

Our July General Meeting will feature Dr. Iair Arcavi from the Las Cumbres Observatory. His topic this evening is “Supermassive Black Holes Tearing Stars Apart.”

OUTREACH SUMMARY

Since the last newsletter, AU volunteers Andy Allen, Emilio Antonucci, Mike Chibnik, Jamie Clark, Tim Crawford, Mike Farris, Ruben Gutierrez, Art Harris, Baron Ron Herron, Jürgen Hilmer, Sean Kelly, Ken Kihlstrom, Chris Larson, Adrian Lopez, Pat & Chuck McPartlin, Janet & Martin Meza, Bonnie & Bruce Murdock, Max Neufeldt, Edgar Ocampo, Peggy O’Rork, Dianne & Russell Ruiz, David Salvia, Colin Taylor, Tom Totton, Chris Ulivo, Tom Whittemore, and Jerry Wilson showed cool astronomy stuff to 1405 visitors.

JULY OUTREACH EVENTS

The Telescope Workshop meets on Tuesday evenings at 7:30 PM at the Broder Building at SBMNH. Contact Tim Crawford at tcrawf3@cox.net for information. Listen to the AU on the radio at KZSB 1290 AM at 9 AM on the second and fourth Monday of each month.

Pat & Chuck will be absent from outreach from July 19 to August 5, so if you can come out and help during that period, we would be grateful.

SATURDAY, JULY 1, SETUP 8 PM

Slide show and telescopes for campers at Cachuma Lake Campground. We set up on the grassy field at Dakota Plains.

TUESDAY, JULY 4, SETUP 7 PM

Telescope Tuesday at the Camino Real Marketplace in Goleta. Fireworks! We set up in the plaza by the theater.

THURSDAY, JULY 6, SETUP 7 PM

Telescopes for Bacara Resort and Spa. We set up on the bluff lawn next to the Angel Oak restaurant.

FRIDAY, JULY 7, 7 PM

AU monthly meeting in Farrand Hall at SBMNH. Dr. Iair Arcavi from Las Cumbres Observatory will be our speaker.

SATURDAY, JULY 8, 5 PM

Planning meeting in the classroom next to Javier's office at SBMNH. Come plan your club's activities. All are welcome.

SATURDAY, JULY 8, 8 PM

Monthly Public Star Party, next to Palmer Observatory at SBMNH.

WEDNESDAY, JULY 12, SETUP 8 PM

Slide show and scopes for Carpinteria State Beach. We set up on the sidewalk toward the ocean from the entry kiosk.

THURSDAY, JULY 13, SETUP 7 PM

Telescopes for Bacara Resort and Spa. We set up on the bluff lawn next to the Angel Oak restaurant.

FRIDAY, JULY 14, SETUP 8 PM

Telescopes for Refugio State Beach, in the SW corner of their day use parking lot.

SATURDAY, JULY 15, SETUP 8 PM

Slide show and telescopes for campers at Cachuma Lake Campground. We set up on the grassy field at Dakota Plains.

THURSDAY, JULY 20, SETUP 7 PM

Telescopes for Bacara Resort and Spa. We set up on the bluff lawn next to the Angel Oak restaurant.

FRIDAY, JULY 21, 8 PM

Monthly Public Telescope Night at Westmont College, at their observatory, next to the baseball field.

SATURDAY, JULY 22, SETUP 8 PM

Telescopes for Refugio State Beach, in the SW corner of their day use parking lot.

THURSDAY, JULY 27, SETUP 7 PM

Telescopes for Bacara Resort and Spa. We set up on the bluff lawn next to the Angel Oak restaurant.

SATURDAY, JULY 29, SETUP 8 PM

Slide show and telescopes for campers at Cachuma Lake Campground. We set up on the grassy field at Dakota Plains.

Events are subject to change, so to get the latest information on schedules, or directions, just contact Chuck at 964-8201 or macpuzl@west.net

From the President...

Jerry Wilson

In 1865, James Clerk Maxwell developed a set of four equations that unified electricity and magnetism into a single fundamental entity: the electromagnetic field. Electricity and magnetism are merely two different aspects of a single thing. As any freshman physics major learns, these equations can be manipulated into the form of a wave equation; that is, a second derivative with respect to space being proportional to a second derivative with respect to time. The resulting wave equation describes light as an electromagnetic wave. We'll talk about light as a particle later.

Because other waves that people are familiar with,

such as sound waves or ocean waves, need a medium to propagate in, it was natural to assume that light also needed a supporting medium. But it was clear that light waves could travel through a vacuum; after all, starlight travels through the vacuum of space to reach the Earth. So, a vacuum might still have something in it to support light. But what was that something? The vacuum demonstrated by Torricelli remained the ultimate nothing for less than a century.

The hypothetical residual medium in a vacuum was called the luminiferous aether, or just the aether, and the hunt was on to characterize it. In a sense, scientists were trying to characterize the remaining something in the nothing of a vacuum. A number of experimental tests were devised, with the most famous and definitive being the Michelson-Morley experiment in 1887. This experiment measured the speed of light (c) very precisely using an interferometer on a rotating block of granite. The purpose was to find any difference in c along the direction of the Earth's orbit, and perpendicular to it. Along the Earth's orbit, the value of c measured would have the Earth's speed added, but perpendicular would not. No difference in c could be found. The experiment has been repeated several times, with increasing precision, up into the 1920's, but with still no observable difference.

The development of the special theory of relativity in 1905 explained why there can be no difference in c resulting from a difference in velocity of the measurer. So, the intuitive notion of an aether was dead. But the vacuum is still not nothing. It gets even more counter-intuitive, but interesting, with development of quantum mechanics.

Some back yard thoughts...

Tom Whittemore

This past June I flew to Indianapolis to celebrate my 50th high school reunion. Before I drove to southern Indiana for the reunion, I stayed with my sister, Grace. The first evening I was there we sat in her back yard and watched lightning bugs come out around sunset. For those of you who are not familiar with these gentle insects, they produce a brief burst of yellow light that, at most, lasts only a couple of seconds. As I watched these wonderful insects, I noticed that it was rare that any two of

them “signaled” at the same time. About twenty to thirty of these “twinklers” randomly moved about as the yard darkened.

A thought occurred to me - and it’s not an original one – in fact, Tim Ferris uses the model of a Christmas tree with randomly twinkling lights in his wonderful 2-hour series, “Life Beyond Earth” to represent distant civilizations that could exchange electromagnetic signals when any two of them are “lighted” at the same time. Ferris’ model plays into my back yard experience. Suppose that the lightning bugs represent civilizations that are able to send and receive messages to other civilizations as long as the light is “on.” These might represent advanced races, which have reached an electromagnetic threshold and have not succumbed to nuclear destruction. When two such races are simultaneously lit, there is a chance that they will be able to exchange messages – become aware of one another – as long as the light-travel time between them is sufficient to guarantee communication. Of course, it could be the case that the sending civilization “flickers out” during signal transmission. The receiving civilization would then detect information from a ghost society that has since vanished. On the other hand, a receiving civilization might vanish while signals wash onto their no longer fertile shores.

For a little more than one hundred years we have reached this electromagnetic threshold. Our radio signals have been spreading out into space since the early 1900s. “I Love Lucy” could now be reaching extra-solar systems 60 light years away. And, if these systems are as advanced as we are, they could send back “I Love Zarkon.” But, of course, this program would not arrive for another 60 years. And put at risk any chance for “episode binging.”

Something to think about if you get the chance to watch lightning bugs this summer....



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July 2017

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 CACHUMA LAKE 8PM
2	3	4 CAMINO REAL MARKETPLACE 7PM	5	6 BACARA RESORT AND SPA 7PM	7 GENERAL MEETING 7PM	8 PLANNING MEETING 5PM STAR PARTY 8PM SBMNH
9	10 TECH TALK KZSB (AM 1290) 9-10AM	11	12 CARPINTERIA STATE BEACH 8PM	13 BACARA RESORT AND SPA 7PM	14 REFUGIO STATE BEACH 8PM	15 CACHUMA LAKE 8PM
16	17	18	19	20 BACARA RESORT AND SPA 7PM	21 WESTMONT COLLEGE 8PM	22 REFUGIO STATE BEACH 8PM
23	24 TECH TALK KZSB (AM 1290) 9-10AM	25	26	27 BACARA RESORT AND SPA 7PM	28	29 CACHUMA LAKE 8PM
30	31					

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