



AU AstroNews

The Newsletter of the Astronomical Unit

January 2020

Sponsored by the Santa Barbara Museum of Natural History



Chuck shares the sky with the public at the Ritz-Carlton Bacara. Photo credit: Tom Totton.

JANUARY GENERAL MEETING

Our speaker for the January meeting will be Dennis Willet from the Ventura County Astronomical Society. The title of his talk is "Asteroids R Us." He writes: "Dennis Willet became enamored in astronomy when he discovered Sky and Telescope magazine in the Jr. high school library in Riverside California. He built a 4.25 inch reflector from an Edmund Scientific kit at age 13 and after finding all 105 Messier objects got another Edmund kit and ground and polished the 8 inch parabolic mirror for his second scope. Riverside was a great place to get started in astronomy. He joined the Riverside Astronomical Society and participated in their lunar grazing occultation program and the first ever Riverside Telescope Makers Conference. Dennis completed his BS and MS in physics at CSU Northridge and researched thin film semiconductors for solar energy before managing the construction of multi megawatt solar power plants in California and Florida. His latest self-inflicted astronomy project is to photograph the first 1000 named asteroids."

OUTREACH SUMMARY

Since the last newsletter, AU volunteers Raf Cottom, Tim Crawford, Tessa Flanagan & Duff Kennedy, Pat & Chuck McPartlin, Janet & Martin Meza, Bonnie & Bruce Murdock, Edgar Ocampo, Javier Rivera, Peggy O'Rork, Charles Schueler, Tom Totton, Tom Whittemore, and Andre Yew showed cool astro stuff to 721 visitors.

JANUARY OUTREACH EVENTS

Here's what's scheduled so far for January. Remember, events are subject to change, so for the latest updates, contact Chuck at 964-8201 or macpuzl@west.net.

The Telescope Workshop meets most 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.

FRIDAY, JANUARY 3, 7 PM

Our first monthly meeting of the year in Farrand Hall at SBMNH. Hear about asteroids.

THURSDAY, JANUARY 9, SETUP 4 PM

Telescopes for Science Night at Hope School, 3970 La Colina Road. This year, we'll set up in the back playground blacktop area.

SATURDAY, JANUARY 11, 5 PM

Monthly AU planning meeting in the classroom outside Javier's office. Come help your club plan our activities for the coming year.

SATURDAY, JANUARY 11, 7 PM

Monthly SBMNH Star Party. Bring a scope, or just come out and mooch some views of the winter sky.

WEDNESDAY, JANUARY 15, SETUP 5 PM

Telescopes for Santa Barbara Community Academy, on the grounds of La Cumbre Middle School, 850 Portesuello Avenue. We set up in the lunch area at the edge of the playing fields, next to the back parking lot.

FRIDAY, JANUARY 17, SETUP 6 PM

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

THURSDAY, JANUARY 23, SETUP 5 PM

Telescopes for Science Night at Brandon School, at 195 Brandon Drive in Goleta. We set up in their central courtyard. Buffet food for volunteers.

TUESDAY, JANUARY 28, 7 PM

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

Note that Telescope Tuesday will be the fourth Tuesday of each month for 2020.

WEDNESDAY, JANUARY 29, SETUP 5 PM

Telescopes for Cleveland Elementary School, at 123 Alameda Padre Serra. We'll set up on their playground, accessed through a gate at the west edge of the entry parking lot.

THURSDAY, JANUARY 30, SETUP 5 PM

Telescopes for Science Night at Adams School, at 2701 Las Positas Road. We set up on the blacktop playground.

From the President

Jerry Wilson

“Astronomical Cameras”

The types typically used today, among amateurs and at outreaches are: Monochromatic, single shot color, DSLR, webcams, and cell phones. Monochromatic refers to a CCD or CMOS architecture where the entire photosensitive chip takes an image in one color at a time. If no filter is used, then a luminance frame is taken capturing all colors at once producing a gray scale image. To generate a color image a red, blue, and green filter are used in sequence with the resulting images combined to produce an RGB or chrominance image. These cameras are temperature-controlled, so all images are taken at exactly the same temperature. It takes four separate images to generate an LRGB or color astro image.

Single-shot color uses a CCD or CMOS focal plane array, but this time with red, green, or blue filters

permanently applied to each individual detector or pixel, called a Bayer filter. Separate red, green, blue, and luminance frames are software generated by a “de-Bayer” program in post-capture processing. These cameras also have a temperature-controlled focal plane. This type of camera takes image data faster than monochrome cameras, but of lower resolution for the same format chip and pixel size. DSLR or Digital Single Lens Reflex cameras use CMOS focal plane arrays with a Bayer filter, but these are not cooled. Post-capture image processing is a bit trickier because the focal plane temperature is not controlled. Typical examples of these are sold by Canon or Nikon and are commonly used for daytime photography, but can be made to produce stunning celestial images if processed properly. Webcams are also CMOS but with a fixed lens and a limited range of sensitivity. Intended for use on computers under room lighting, they can be made to image brighter objects, primarily the moon and planets, through stacking individual subframes captured from videos. Some are packaged to fit in a telescopes eyepiece and are sold as planetary cameras. They come in color (Bayer filter) or black and white versions. Cell phones are similar to webcams, but generally more flexible and much higher resolution. CCD and CMOS cameras both use Si as the detector but differ in the on-chip’s preamp placement. CCD uses a single preamp with the signal from each detector processed in series. CMOS has a preamp in each unit cell of the array and processes detector signals in parallel. Because of this architecture CMOS can download an image faster and is commonly used in video output cameras. CCD cameras are used for scientific data collection but not used in consumer cameras because of their longer frame time.



“Run those numbers by me again, Tim. Do you mean to tell me that, if I get up to half the speed of light, I could make it to Aldebaran by New Year’s Day?” Photo credit: Tom Totton.

Capella

Tom Whittemore

This month we turn our attention to the northeastern sky – at about 7 PM. Well up at this time is Auriga, the Charioteer. Most people view this constellation as a pentagon whose southernmost star, El Nath (β Aurigae), also belongs to Taurus the Bull as the tip of one of his horns. But tonight our gaze is set on the beautiful Capella. Following Sirius, Arcturus, and Vega, Capella is the fourth brightest star visible to northern observers and ranks as the sixth brightest star in the heavens. Notice how yellow it appears. This is because it has roughly the same surface temperature as the Sun. And, located about 45 light-years from Earth, it still shines without much competition in this part of the night sky. However, if you were to place our Sun at this distance, it would be about as bright as the dimmest star in the handle of the Little Dipper! Serving as the “she-goat,” Capella nurses three small goats known as the “kids.” These must be innately very bright stars since they lie at distances of 370, 1200, and 3000 light-years from us – a long way from their mother!



Drawing above taken from smokymtastro.org.

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January 2020

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
			1	2	3 GENERAL MEETING 7PM	4
5	6	7	8	9 HOPE SCHOOL 4PM	10	11 PLANNING MEETING 5PM SBMNH STAR PARTY 7PM
12	13 TECH TALK KZSB (AM 1290) 9-10 AM	14	15 SB COMMUNITY ACADEMY 5PM	16	17 WESTMONT COLLEGE 6PM	18
19	20	21	22	23 BRANDON SCHOOL 5PM	24	25
26	27 TECH TALK KZSB (AM 1290) 9-10 AM	28 CAMINO REAL MARKETPLACE 7PM	29 CLEVELAND ELEMENTARY 5PM	30 ADAMS SCHOOL 5PM	31	