



AU AstroNews

The Newsletter of the Astronomical Unit

September 2016

Sponsored by the Santa Barbara Museum of Natural History



Readied for the next lucky viewer. Photo: Bruce Murdock.

THE SEPTEMBER GENERAL MEETING

Our speaker for the September General Meeting will be our own Chuck McPartlin who will speak about his passion for timing asteroid occultations.

Chuck's summary for his talk follows: "An asteroid occultation occurs when an asteroid passes between you and a distant star. For a brief interval, the star's light is blocked, and you see it wink out. If enough people along the path of the occultation collect video of the event with accurate timing and location from GPS, the shadow on the Earth can be mapped, showing the size and shape of the asteroid to great precision. Binary asteroids and asteroid moons can be detected, and recently the Centaur asteroid Chariklo was found to have rings via an occultation. Unknown double stars can also be discovered. An organization called the International Occultation Timing Association, or IOTA, disseminates predictions for such events, provides free software, and collects and analyzes observation reports. They also observe occultations and grazes of stars by the Moon to detect double stars, measure star diameters, and refine the topography of the lunar surface."

He continues. "I like participating, because I can be pretty stupid; all I have to do is find the target star and record the video, and yet I can contribute to the collection of astronomical knowledge. Asteroid

occultations are also relatively unaffected by light pollution, so I don't have to hunt for dark skies. I've already made the newbie mistakes for you. I'll tell you what you need to do to get started, and where to look for information. If you like citizen science, consider giving occultations a try!"

OUTREACH SUMMARY

Since the last newsletter, AU volunteers Warren Bitters, Bill Clausen, Adrian Conrad, Tim Crawford, Mike Farris, Art Harris, Jürgen Hilmer, Sean Kelly, Ken Kihlstrom, Chris Larson, Adrian Lopez, Zanna Lucy, Pat & Chuck McPartlin, Janet & Martin Meza, Bonnie & Bruce Murdock, Max Neufeldt, Edgar Ocampo, Mark Redmon, Bob Richard, Javier Rivera, Russell & Dianne Ruiz, David Salvia, Gary Schneider, Alec Sherwin, Colin Taylor, Cez & Tom Totton, Chris Ulivo, Tom Whittemore, Patricia & Jerry Wilson, Paul Winn, and Linda & Harold Yarbrough showed sky goodies at outreaches to **2014** visitors.

SEPTEMBER OUTREACH EVENTS

Here are the events scheduled so far for the month. Outreach 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

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.

FRIDAY, SEPTEMBER 2, 7 PM

Monthly AU meeting in Farrand Hall at SBMNH. See a quick planetarium show, then hear a talk on asteroid occultations.

SATURDAY, SEPTEMBER 3, SETUP 7 PM

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

MONDAY, SEPTEMBER 5, SETUP 7 PM

Telescopes for campers at Refugio State Beach. We set up in the day use parking lot at the southwest corner of the park.

WEDNESDAY, SEPTEMBER 7, SETUP 8 PM

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

SATURDAY, SEPTEMBER 10, SETUP 9 AM

Astro-Vaganza! all day at SBMNH. Solar scopes and astronomy activities during the day (10:00-3:30), and a star party in the evening (7-10).

TUESDAY, SEPTEMBER 13, SETUP 7 PM

Telescope Tuesday at the Camino Real Marketplace. We set up in the plaza next to the theater.

FRIDAY, SEPTEMBER 16, SETUP 7 PM

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

WEDNESDAY, SEPTEMBER 21, SETUP 8 PM

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

FRIDAY, SEPTEMBER 23, SETUP 7 PM

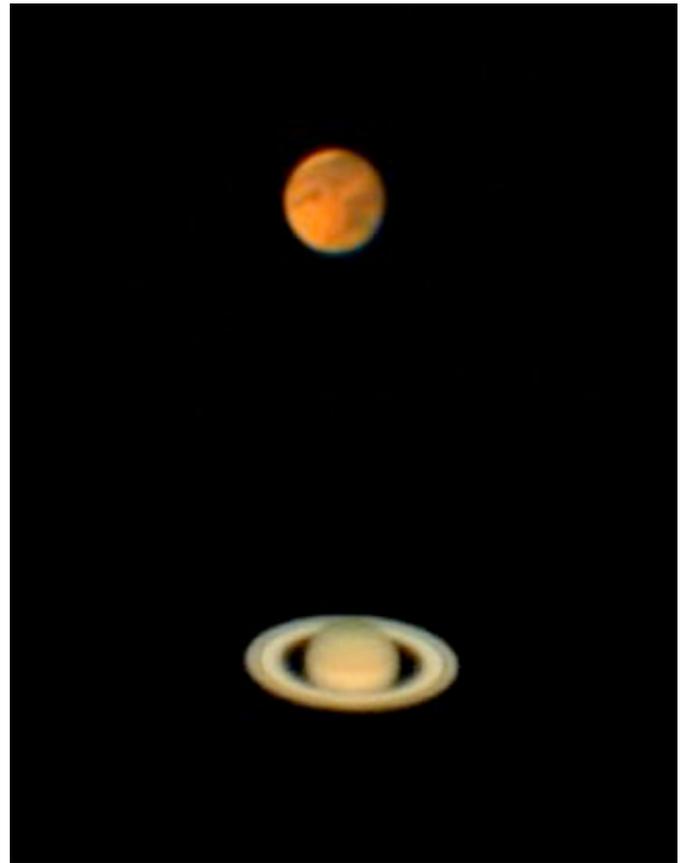
Slide show and telescopes for campers and a Cub Scout Troop at Cachuma Lake Campground. We set up on the open field at Dakota Plains.

FRIDAY, SEPTEMBER 30, SETUP 7 PM

Telescope Night for a group of STEM students at Westmont College, at the observatory, adjacent to the baseball field.



"Anybody have a hammer and chisel?" Photo: T. Totton.



Dr. Bob Richard took these amazing images of Mars and Saturn this past summer in the skies of Scottsdale, Arizona.

What's up with Orbits – Conclusion

Jerry Wilson

We start with a large cloud of dust and gas. About 24 light years across should do. That's the estimated width of the Orion Nebula (M42). The dust is grains of rock, minerals and ices probably about sand grain size down to fine powder. The gas is mostly hydrogen. Bigger molecules are there too, like methane, but I include that under ices for the nebula. Every single particle in this mélange of stuff is gravitationally attracted to every other particle. They bump and bounce and get closer together and their motion changes slowly from random to a common average. As the material collects under its own gravity any rotation speeds up as the cloud collapses, not into a sphere but into a disk. The center of the disk and other local centers or swirls condense into planets or stars depending on how much material they can attract. Finally, individual spherical masses have enough material so that self-gravity can overcome the rigidity of the material it is made of and the mass collapses. This collapse causes internal heating, and when the temperature reaches ten million degrees any hydrogen present, and it's mostly hydrogen, begins to fuse to form

Helium. The fusion process is self-sustaining and generates energy until all the hydrogen is consumed. That takes about ten billion years for our sun.

The heat produced in the core works its way to the surface and radiates into space. A star is born. It gives off radiation and particles in the form of a stellar wind which eventually blows away any leftover dust and gas that hasn't been incorporated into the star or its planets. The nebula now becomes an open star cluster.

Each star in the cluster is in a slightly different orbit around the galactic core and as time passes they slowly drift apart and the star cluster dissipates. There is a research project underway to try to locate stars that were once in the cluster with our sun and condensed out of the same nebula. It goes like this: we know how old our sun is and we know its orbit in the galaxy, so we can backtrack to find the location of our sun when it formed. Other stars are located which have similar luminosity, mass and spectral properties to our sun and their orbits are determined and backtracked to where they were formed. If it's a match, a sister star to our own has been located. One star has so far matched. It is HD 162826, 110 light years away located in Hercules. It's not a twin of our sun, but a sibling. It's 15% more massive than our sun.



"Wait 'til they see that I sprinkled some sand in their pitch..."
Photo: T. Totton.

AU Information Box

President: Tom Totton
president@sbau.org

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

Secretary: Adrian Lopez, Adrian Conrad
secretary@sbau.org

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

Refreshments: Janet & Martin Meza 450-8383
AguilarPerryMeza@gmail.com

Webmaster: Paul Winn 886-2319
webmaster@sbau.org

SBMNH Astronomy Programs Manager

Javier Rivera 682-4711x173
jrivera@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>

September 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 AU GENERAL MEETING 7PM	3 CACHUMA LAKE 7PM
4	5 REFUGIO STATE BEACH 7PM	6	7 CARPINTERIA STATE BEACH 8PM	8	9	10 ASTRO- VANGANZA ALL DAY AT THE SBMNH
11	12 TECH TALK KZSB (AM 1290) 9-10AM	13 CAMINO REAL MARKETPLACE 7PM	14	15	16 WESTMONT COLLEGE 7PM	17
18	19	20	21 CARPINTERIA STATE BEACH 8PM	22	23 CUB SCOUTS CACHUMA LAKE 7PM	24
25	26 TECH TALK KZSB (AM 1290) 9-10AM	27	28	29	30 WESTMONT COLLEGE 7PM	

The Astronomical Unit

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