



AU AstroNews

The Newsletter of the Astronomical Unit

April 2019

Sponsored by the Santa Barbara Museum of Natural History



Bruce Murdock captured this amazing lightning strike from his home in Goleta in early March this year.

APRIL GENERAL MEETING

Our April speaker will be Dr. Dirk Bouwmeester from the UCSB Physics Department. The title of Dirk's talk is "The Quantum Revolution and How it Reveals our Place in the Universe." Our speaker paraphrases: "If people look back in 1000 years they will most likely identify the current age as the time of the quantum revolution. Quantum mechanics has caused an unprecedented increase in our knowledge of the world around us. In just over 100 years we unravelled the nature of elementary particles and were able to (largely) reconstruct the evolution of the universe. We understand the formation of complex molecules and unravelled many of the mysteries hidden in living cells and organisms. Quantum mechanics has also rapidly become deeply integrated in our society through the design of semiconductor materials that are at the heart of computation and communication systems. In recent years the mysterious properties of quantum superpositions are also explored for secure communication and for developing quantum computers. In my talk I will highlight aspects of the quantum revolution and explain quantum cryptography and quantum teleportation. I will conclude with a discussion on how our classical world emerges from the underlying quantum world."

OUTREACH SUMMARY

It was rainy and cloudy, but since the last newsletter AU volunteers Farshad Barman, Mike Chibnik, Tim Crawford, Joe Doyle, Tessa Flanagan & Duff Kennedy, Ruben Gutierrez, Chris Larson, Pat & Chuck McPartlin, Janet & Martin Meza, Bruce Murdock, Edgar Ocampo, Peggy O'Rork, Javier Rivera, Russell Ruiz, David Salvia, Srikanth Saripalli, Tom Totton, Tom Whittemore, and Jerry Wilson showed cool stuff in the sky to 1185 people.

APRIL OUTREACH EVENTS

Our big event this spring is the Girl Scout Kaleidoscope event on April 27. 1200 Girl Scouts. Come out and help!

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

The Telescope Workshop meets on 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.

TUESDAY, APRIL 2, SETUP 7 PM

Telescopes for an Astronomy Night at Goleta Valley Junior High School, 6100 Stow Canyon Road. We set up on the playground blacktop on the west side of campus. Will it rain again?

THURSDAY, APRIL 4, SETUP 7:30 PM

Telescopes for Fifth Graders at Hope School, 3970 La Colina Road. We set up on the playground blacktop around back through the gate.

FRIDAY, APRIL 5, 7 PM

Monthly AU meeting in Farrand Hall at SBMNH. Dr. Dirk Bouwmeester of UCSB Physics will speak about "The Quantum Revolution and How it Reveals Our Place in the Universe."

TUESDAY, APRIL 9, SETUP 7 PM

Telescope Tuesday at the Camino Real Marketplace in Goleta, in the plaza by the theater.

SATURDAY, APRIL 13, 5 PM

AU planning meeting in the classroom outside Javier's office at SBMNH.

SATURDAY, APRIL 13, 7 PM

Monthly Public Star Party at the Santa Barbara Museum of Natural History.

THURSDAY, APRIL 18, SETUP 5 PM

Telescopes for Science Night at Mountain View School, 5465 Queen Ann Lane in Noleta. We set up on the blacktop out back. Dinner for volunteers.

FRIDAY, APRIL 19, 7:30 PM

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

SATURDAY, APRIL 20, SETUP 6 PM

Telescopes for the Ritz-Carlton Bacara. We set up on the bluff by the Angel Oak Restaurant.

THURSDAY, APRIL 25, SETUP 4:30 PM

Telescopes for Science Night at Monte Vista School, 730 N Hope Avenue. We set up by the kindergarten playground on the south edge of campus.

SATURDAY, APRIL 27, SETUP 5 PM

Girl Scout Kaleidoscope event at Live Oak Campground, at 4600 CA-154. We enter by the Rancho San Marcos Golf Course. Dinner for volunteers. Contact Chuck for information.

From the President

Jerry Wilson

A slightly more detailed sequence of events in our view of the Big Bang has resulted from an unexpected source. That source is the fact that two different measurements of the Hubble constant have disagreed with each other. It turns out the disagreement is a real effect and not a measurement

error. However, the two measurements are derived in two different ways and could represent two different times in our universe's history.

The Hubble constant is a measurement of the speed with which distant objects are moving away from us as a function of distance. Farther objects are moving away faster. The units are kilometers per second per megaparsec or km/sec/Mpc.

The Hubble constant can be measured by looking at the redshift that results from this expansion of the universe and the distance to the object being observed to yield a value of 73.24 km/sec/Mpc. Or, it can be measured from fluctuations observed in the Cosmic Microwave Background combined with the Standard Model of Physics to yield a value of 66.53 km/sec/Mpc. The uncertainties in the measurements are smaller than the difference in these two values.

According to a Feb 5, 2019 article by Dennis Overbye in the New York Times, a group of astronomers at Johns Hopkins University have postulated that when the universe was only about 100,000 years old a "strange new energy field switched on." That energy field was essentially an antigravity field that gave spacetime a period of acceleration, and then switched off after another 100,000 years. So, this could give us a more detailed look at the early sequence of the Big Bang.

Others have proposed a new subatomic particle, such as a fourth flavor of neutrino, or that Einstein's General Theory needs a slight tweak.



"Whaddya mean you don't understand the intricacies of Quantum Field Theory?" Photo credit: T. Totton.



Tim Crawford shows off his clever design for his 8" telescope's secondary cage. Photo credit: Tom Totton.



"According to my calculations, just to get here on time, you must have been traveling at half the speed of light!" Photo credit: Tom Totton.



The Marymount Makers Fair is underway! Photo credit: Tom Totton.

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The Astronomical Unit

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April 2019

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2 GOLETA VALLEY JH 7PM	3	4 HOPE SCHOOL 7:30PM	5 GENERAL MEETING 7PM	6
7	8 TECH TALK KZSB (AM 1290) 9-10 AM	9 CAMINO REAL MARKETPLACE 7PM	10	11	12	13 PLANNING MEETING 5PM STAR PARTY 7PM SBMNH
14	15	16	17	18 MOUNTAIN VIEW SCHOOL 5PM	19 WESTMONT COLLEGE 7:30PM	20 RITZ-CARLTON BACARA 6PM
21	22 TECH TALK KZSB (AM 1290) 9-10 AM	23	24	25 MONTE VISTA SCHOOL 4:30PM	26	27 GIRL SCOUT KALIEDOSCOPE EVENT 5PM
28	29	30				