



AU AstroNews

The Newsletter of the Astronomical Unit

January 2015

Sponsored by the Santa Barbara Museum of Natural History



"You gotta help me! Every time I bake fresh bread, it tastes like pitch!" Photo credit: Tom Totton.

OUR JANUARY SPEAKER

Our speaker for the January meeting will be Theo Clarke, whose topic is "Juno and the New Renaissance." A synopsis of his talk follows: "The Juno spacecraft was launched August 5, 2011. It looped around the sun and returned to Earth on October 9, 2013 for a gravity assist that slung it on its journey to the planet Jupiter. Juno will arrive at Jupiter on July 4, 2016 to begin a one-year investigation of that giant planet. The high-level science objectives of the Juno mission at Jupiter are to determine the concentration of water in Jupiter's atmosphere, the existence and size of a solid core, and the nature of Jupiter's huge magnetic field. With this information Juno scientists hope to catch a glimpse of the dawn of creation of our own solar system. But Juno is much more than a space laboratory to study the planet Jupiter. Juno is the embodiment of a remarkable union of science, technology, literature, music, art, and public engagement. As Juno sails the cosmic sea to Jupiter it can be deemed an ambassador to the universe of a New Renaissance."

In a 27 year career at the Jet Propulsion Laboratory Theo Clarke worked as scientist and engineer on the Mariner 10 mission to Venus and Mercury, the Voyager mission to the outer planets, and the Galileo mission to Jupiter. He is the recipient of

NASA's prestigious Exceptional Service Medal for his service and dedication to Galileo's Earth encounters. He has lectured on the U.S. space program all over the world, including to all three U.S. military academies. Clarke is currently an Adjunct Professor of Physics at Pasadena City College and a consultant on NASA's Juno mission to the planet Jupiter.

DECEMBER OUTREACH

Since the last newsletter, AU volunteers Chatt Aiton, Henk Aling, Peter Angeloff, Angela Bates, Krissie Cook, Joe Doyle, Mike Farris, Ruben Gutierrez, Art Harris, Madeline & David Hallowell, Audree Hashibe, Ken Kihlstrom, Chris Larson, Pat & Chuck McPartlin, Janet & Martin Meza, Bruce Murdock, Max Neufeldt, Edgar Ocampo, Javier Rivera & the Quasars, Rachel & Kevin Rose, David Salvia, Colin Taylor, Tom Totton, Tom Whittemore, Patricia & Jerry Wilson, and Linda & Harold Yarbrough showed cool astro stuff to **931** visitors.

A big THANK YOU to all the dedicated AU outreach volunteers of 2014! Just help out at six AU outreach events in a year, and your membership gets extended a year, and a certificate and pin from the Night Sky Network, which will be awarded at the February meeting.

JANUARY 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.

FRIDAY, JANUARY 2, 7 PM

Catch a quick planetarium show by Javier, followed by our first monthly meeting of the year in Farrand Hall at SBMNH. Theo Clarke of NASA/JPL will speak about the Juno mission, arriving at Jupiter on July 4, 2016.

SATURDAY, JANUARY 10, 5 PM

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

SATURDAY, JANUARY 10, 7 PM

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

THURSDAY, JANUARY 15, SETUP 4:30 PM

Telescopes for Science Night at McKinley School, at 350 Loma Alta Drive near SBCC.

FRIDAY, JANUARY 16, SETUP 6 PM

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

SUNDAY, JANUARY 18, SETUP 5 PM

Telescopes for Bacara Resort, on the Miró Lawn.

WEDNESDAY, JANUARY 21, SETUP 6 PM

Telescopes for Bacara Resort, on the Miró Lawn.

THURSDAY, JANUARY 22, SETUP 4:30 PM

Telescopes for Science Night at Monte Vista School, at 730 North Hope Avenue in Santa Barbara. We set up on the south side of the campus, near the kindergarten playground. Pizza for volunteers.

TUESDAY, JANUARY 27, 7 PM

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

THURSDAY, JANUARY 29, 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.

MARK YOUR CALENDAR

Big outreach events for 2015 include a total lunar eclipse (early morning April 4), Astronomy Day (April 25), the Kaleidoscope Girl Scouts event at Live Oak (May 2), Astrovaganza (September 12), and another total lunar eclipse (evening of September 27).

From the Workshop

Tim Crawford

Here is a story that has a somewhat obscure but related connection with telescope mirrors.

I work at a storefront next to a glass shop where I park behind this building in an alley between apartments and the storefront. The other day, as I walked from my car to the front, a reflection of afternoon sunlight from a nearby window caught me in the back of my neck. It was at least 15 degrees warmer than the ambient air!

Because of this searing experience, I brought it up with the glass shop owner. To my surprise he told me a story of a customer who had called and said their patio furniture melted and they thought this was due to reflections of sunlight from their windows. At first he passed it off as lunacy. I became interested.

The owner of the glass shop started checking for other stories like this, and started to find incidents that were similar. He even talked of a case for which he may be sued because of this phenomenon. Curious, he began looking for answers.

The glass shop owner went to the house of the customer who claimed his patio furniture had melted. Still skeptical that reflections of the sun could melt things, he was surprised to find scorch marks that traced an obvious arc. Further, this arc seemed to match sun's path across the sky. He imagined the reflected sunlight could be the heat source. Still incredulous, he had his men check the shape of the window. They placed a level on the window's surface and found that the window did, in fact, have a curved surface! This window acted like a large mirror! So, if the sun were just at the right altitude the windows would reflect and converge the sun's light and concentrate the beam onto those steaming patio chairs. And, at the focal distance of the window, the beam could be concentrated enough to turn the patio chair into a hot seat!

Our neighbor called the glass suppliers and consulted with the factory managers. He asked that they check their windows for this concavity. They acted passively and, as he did, skeptically. I asked our neighbor if he thought windows of this type could actually start fires where in rural areas the consequences would be devastating. He said it would not surprise him at all.

In the meantime, I will check with our workshop folks on how this phenomenon can work. I'd like a little more concrete evidence and math. Maybe

there's an inverse square law at work here. I know they will have some great feedback. I am also thinking as with telescope mirrors, it may be dependent on the size of the window and what curve the window has.

Since this phenomenon is likely a purely reflective one, my feeling is that the severity of the heating could depend on several things. (1) How large is the window? Larger windows will have more surface area to carry more heat to the focusing area. (2) What is the effective focal length of the window? If the patio chair were to lie a considerable distance either side of this "focal length," it may not suffer such a tragic fate. Also, my guess is that the light comes to its "fuzzy focus" along a line and not at a point. (3) Does this phenomenon happen more often in the winter when the sun is lower in the sky than in the summertime when the sun is much higher in the sky and so would strike a glancing blow across the window? (4) Finally, do some windows have better reflective properties than others? I know some windows have reflective films applied and this is exactly how they are advertised.

It seems to me that the customer's explanation for the melted chair is right, and the glass shop owner may have uncovered something. He already asked the glass suppliers if they could at least make the surface of the glass convex. I joked with him telling him if he installed two of these at opposite sides of the house and it were in line with the setting sun... Well, I like to see humor in things.

For further reading, check this:

<http://news.nationalgeographic.com/news/2013/09/130904-walkie-talkie-building-london-melts-sunlight-physics-science/>

Past Presidents...

With our new club president, Tom Totton, we thought you'd enjoy seeing some of our past presidents.

Mike Farris, 2013-14

Ruben Gutierrez, 2009-12

Tim Wittenburg, 2006-08

Chuck McPartlin, 1998-99, 2005

Pat McPartlin, 2003-04

Greg Brinser, 2002

Tony Galvan, 2001

Warren Bitters, 2000

Bob Brown, 1996-97

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AU annual membership rates:

Single = \$15 Family = \$25

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January 2015

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2 SBAU MEETING 7PM	3
4	5	6	7	8	9	10 SBMNH PLANNING MEETING 5PM STAR PARTY 7PM
11	12	13	14	15 MCKINLEY SCHOOL 5:30PM	16 WESTMONT COLLEGE 6PM	17
18 BACARA SETUP 5 PM	19	20	21 BACARA SETUP 6 PM	22 MONTE VISTA SCHOOL 4:30PM	23	24
25	26	27 CAMINO REAL MARKETPLACE 7PM	28	29 BRANDON SCHOOL 5PM	30	31

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