AU AstroNews

The Newsletter of the Astronomical Unit

March 2016 **Sponsored by the Santa Barbara Museum of Natural History**

Setting up at the Hollister Ranch. Photo: Bruce Murdock.

Our March Meeting

Our March General Meeting will take place on **Friday, March 11th at 7PM**. Our speaker this evening will be Dr. Jim Hartle, Professor Emeritus from UCSB. An expert on General Relativity, Jim will talk about Quantum Cosmology.

Outreach Report

Since the last newsletter, AU volunteers Krissie Cook, Tim Crawford, Joe Doyle, Ruben Gutierrez, Jürgen Hilmer, Ken Kihlstrom, Chris Larson, Pat & Chuck McPartlin, Janet & Martin Meza, Bonnie & Bruce Murdock, Max Neufeldt, Edgar Ocampo, Jane & Gary Peterson, David Salvia, Gordie Thompson, Cez & Tom Totton, Dick Tracey, Javier Rivera & Quasars, Maureen & Tom Whittemore, and Patricia & Jerry Wilson showed the sky to ***1524*** viewers.

March Outreach Events

Here are the AU events scheduled for March. To get the latest information on schedules, or directions, just contact Chuck at 964-8201 or macpuzl@west.net Remember, events are subject to cancellations and changes.

Tuesday, March 1, setup 6:30 PM
Telescopes for an Astronomy Night at Goleta Valley Junior HS, 6100 Stow Canyon Road. We set up on the blacktop to the west of the buildings.

Thursday, March 3, setup 4 PM
Telescopes for Science Night (5-7) at El Camino School, 5020 San Simeon Drive in Goleta.

Monday, March 7, setup 5 PM
Telescopes for Science Night (6-8) at St. Raphael School, 160 St. Josephs Street in Noleta.

Tuesday, March 8, 7 PM
Telescope Tuesday at the Camino Real Marketplace in Goleta. We set up in the plaza by the theater.

Thursday, March 10, setup 4:30 PM
Telescopes for Science Night (5:30-7:30) at Monroe School, 431 Flora Vista Drive, on the Mesa.

Friday, March 11, 7 PM
Note - Not First Friday!
Monthly AU meeting in Farrand Hall at SBMNH. Hear a talk about Quantum Cosmology.

Saturday, March 12, 5 PM
AU planning meeting in the classroom outside Javier's office at SBMNH. All members are welcome to help plan your club's activities.

Saturday, March 12, 7 PM
Monthly Public Star Party at SBMNH, next to Palmer Observatory.

Sunday, March 13, 2 AM
Don't forget to switch to Daylight Saving Time!

Monday, March 14, 9 AM
Hear the AU with Baron Ron Herron on KZSB Radio 1290 AM.

Monday, March 14, setup 7 PM
Telescopes at Westmont Observatory for the Santa Barbara Newcomers Club.

Tuesday, March 15, setup 6 PM
Telescopes for an Astronomy Night (7-9) at La Colina Junior High School, 4025 Foothill Road. We set up to the east of the buildings.

THURSDAY, MARCH 17, SETUP 5:30 PM
Telescopes for Science Night (6:30-8) at Santa Barbara Charter School, on the east end of the campus of Goleta Valley Junior High, 6100 Stow Canyon Road in Goleta.

FRIDAY, MARCH 18, 7:30 PM
Monthly Public Telescope Night at Westmont College observatory. Look through the big scope!

SATURDAY, MARCH 19, 9:30 PM PDT
Vernal Equinox - It's Spring!

FRIDAY, MARCH 25, SETUP 6 PM
Telescopes for an Astronomy Night (7-9) at Girls, Inc. in Carpinteria, at 5315 Foothill Road.

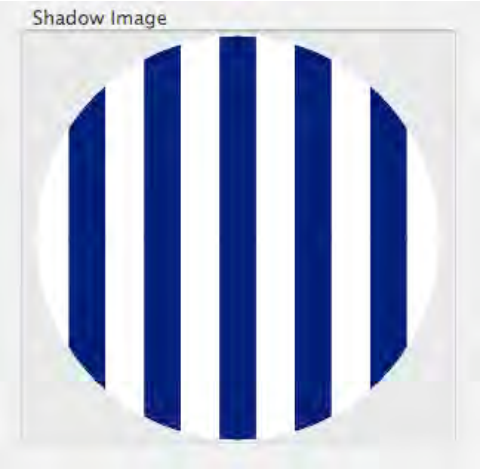
MONDAY, MARCH 28, 9 AM
Hear the AU with Baron Ron Herron on KZSB Radio 1290 AM.

From the Workshop...
Tim Crawford

The Ronchi Test
It has been about a year since we talked about the sensitive tests one might use on an astronomical mirror. The last time we met I discussed the use of the Ronchi screen as a qualitative test for our mirror. In future articles, I will talk about a more quantitative test: The Foucault Knife-edge Test. Let's first review some details for the Ronchi test.

Recall that we placed our mirror on a test stand where light from a slit-like source illuminates the mirror at the distance of the mirror's radius of curvature (R). This light is reflected by the mirror and, before it hits our eyes, is interrupted by a screen of vertical lines very near the light source. Depending on the dimensions of the mirror under test, the frequency of the lines is often about 100 per inch. Line frequencies for larger mirrors (20", say) can be as small as 50 per inch. But, for most of the mirrors we test in our Tuesday workshop, 100 per inch is adequate.

Here is what you would see if your mirror were perfectly spherical.



Notice how the Ronchi lines are unmistakably vertical. This should make sense since the light from the source lies exactly at the mirror's radius of curvature (R). This is the distance at which the mirror is "cut" evenly across its surface. So, all points on the mirror's surface are "cut" with the same curvature.

Now let's suppose we have done a bit of parabolization on our mirror. That is, we have "deepened" the mirror carefully and uniformly so that it will bring to focus parallel light from a distant source. Fortunately we can still test our mirror on our test bench with light striking our mirror from a distance R. The return lines will no longer be vertical because our mirror now has the shape of a paraboloid – the desired curvature of an astronomical mirror. Without going into the subtleties of how this parabolizing is done, think of our mirror as now having many radii of curvature. Or, if you like, imagine our mirror now has a set of "nested spheres" whose centers are located at different distances from our light source. The longest of these radii lies at the mirror's edge. Conversely, the shortest lies at the center of our mirror. Below is a figure one might see for the returning light from a 100% parabolized mirror with a focal ratio of 5. By this I mean that the ratio of the mirror's focal length to its diameter is 5:1. This could be a 10" mirror with a focal length of 50" or a 20" mirror with a focal length of 100". Either mirror would exhibit the same Ronchi screen figure.

Technically, I have thrown you a slight curve. This is what you would see if you were to look at the returned light slightly *inside* the mirror's radius of curvature. When you "back off" the source to be slightly *outside* the mirror's radius of curvature, you would see this:

The degree to which these curved images can be "matched" by the tester – inside R and outside R – determines the rough quality of the mirror. It is not a quantitative test by any means. But it is a "first cut" test. And, for those mirrors of focal ratios of 8 or larger, it may be an adequate test for a finished mirror.

"Yes. That's right. I have seen the jet in M87 with this modest telescope!"

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

March 2016

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1 GVJHS 6:30 PM	2	3 El Camino School 4 PM	4	5
6	7 St. Raphael School 5 PM	8 Camino Real Marketplace 7PM	9	10 Monroe School 4:30 PM	11 SBAU General Meeting 7 PM	12 Planning Meeting 5 PM Star Party 7 PM SBMNH
13 Spring Forward for DST! 2 AM	14 KZSB 9 AM Westmont College Newcomers 7 PM	15 La Colina JHS 6 PM	16	17 SB Charter School 5:30 PM	18 Westmont College 7 PM	19 Spring Begins! 9:30 PM
20	21	22	23	24	25 Girls Inc. Carpinteria 6 PM	26
27	28 Tech Talk KZSB (AM 1290) 9-10AM	29	30	31		

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