

# The Observer

SAN BERNARDINO VALLEY AMATEUR ASTRONOMERS  
Member of The Astronomical League

<http://sbvaa.org/>



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Since 1958

January, 2012

## Meeting:

January 14, 2012

### Location:

San Bernardino County  
Museum, 7:00 p.m.  
Redlands, CA. California  
St. exit, I-10 Fwy.

Pre-meeting Dinner, 5:00  
p.m.,

**The Sizzler**  
**1800 So. Waterman**  
**Ave.**  
**San Bernardino, CA**

After the meeting telescopes  
will be set up for viewing  
and members will be  
available to answer  
questions. Bring your  
telescope to observe with us.

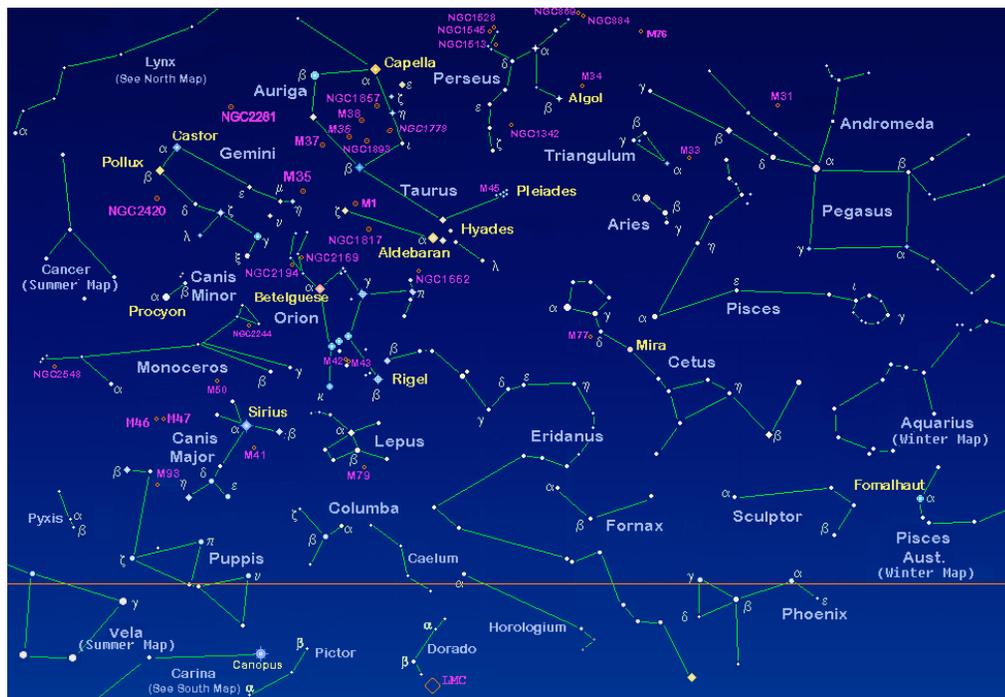
*No telescope is too humble,  
and beginners are always  
made welcome!*

After viewing the group will  
head for Coco's in Redlands,  
Tennessee exit, I-10 Fwy.

## Program

# Observing a Winter Wonderland of Stars!

Martin Carey and Chris Clarke will present a power point program showing and describing the beautiful wonders of the winter sky. Learn about what's up on those sparkling clear crisp nights, as they point out the many brilliant stars, constellations and deep-sky objects that abound this time of year.



Please note that this month's meeting will be held in the "Education" building out in the back. The main building will be full of model train displays, so that's why we're being "relocated" this month.

## SBVAA Officers

President:

Vice President:

Treasurer: Fidel Hernandez 909-864-0615

Secretary - Educational Outreach: Chris Clarke  
909-384-8539 Work  
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Star Party Coordinator: Tom Lawson  
909-8828198

SBVAA Webmaster: Steve Miller 626-859-7776

Newsletter Editor: Jim Sommer 909-792-3587

## Calendar of Upcoming Events

January 21, star party, Afton Canyon, along with HiDAS and PVAA clubs

February 11, club meeting at the Museum

February 18, star party, Johnson Valley

March 10, club meeting at the Museum

March 24, Messier Marathon at GMARS or, at the Wildlands Conservancy, Oak Glen

March 25, (during the day) Dark Skies Presentation

April 14, club meeting at the Museum

## Johnson Valley Star Party Report

By Mike Ratcliff

SBVAA did have a star party announced for Dec 26 at Johnson Valley, and I (Mike) and another member John S. arrived at sunset to find a pretty nice sky developing with no clouds and a light wind. The temps fell rapidly, so lots of warm clothing was a must. Seeing was decent and transparency was good.

We were also greeted by a local bull, the four legged type, who approached our site and stared at us. But he stayed a healthy distance away and then later wandered in another direction. One of the ranchers stopped by and said the bull was heading for a watering hole and would not likely bother us. If it did, we were advised to just let it go through our camp, which was definitely my plan anyway. This area is used for cattle but this is only the second time I've actually seen any.

We were also later treated to a visit by some former students of Rudy Rodriguez's high school astronomy class. Sorry Rudy I don't remember the names, but they were from several years back. One had won a pair of binos as a class prize. They came

after dark and had some difficulty finding the location. We could see their car lights approaching then going back to the highway a couple of times. But they persevered and found us. So we had a good time looking at the major sights in the sky with some good oohs and aahs and question and answers.

All in all a good night. Too bad it wasn't away from the holidays so more people could come out.

## Club Meeting Dates for 2012

February 11

March 10

April 14

May 12

June 9

July 14

August 11 (ann. BBQ)

September 8

October 20

November 17

December (tbd) ann. holiday dinner

## Musings of a Late Night Eclipse Watcher

By Chris Clarke

Before dawn Saturday morning, December 10, the beautiful “Moon before Yule” slowly slipped into the earth’s shadow, becoming totally eclipsed just before sunrise. This was the second lunar eclipse this year, but the only one that we were able to see from here. As celestial events, lunar eclipses are easy to observe as all you really need is a pair of seven power binoculars and a clear view of the sky. This particular eclipse was best observed from the Pacific-Asia region and we on the west coast only got to see the first half of the entire event.

Unfortunately, this one was happening at a most inconvenient hour! Arising a little after 4:00 am, I first checked to see if the sky was clear, and yes, the landscape was all aglow with moonlight! Next, I got dressed and “geared up” for the two hour watch.

My household cats must’ve thought I was crazy to be stirring around in the house at this unholy hour and then disappearing outside to the backyard.

Initial contact with the shadow, or umbra, began about 4:45. I just sat back in a lawn chair and watched the moon slowly be eaten away by the ever-growing rounded shadow of our own world. It’s a lot of fun to see the various large lunar features be covered by the umbra. The famed “lady on the moon,” imaginatively made up of lunar seas and craters, appeared to be kissing the encroaching shadow that made the moon go through a series of crescent-like phases.

Finally, right after 6:00, the moon was completely covered, but did not disappear. Because of atmospheric refraction, light coming around the edge of the earth is focused into the shadow and makes it to the moon. Only the longer wavelengths of light, orange

and red, make it through, giving the moon a coppery tint. The moon did indeed have a dim, pale orange color, which was visible to the eye and even prettier to see through binoculars.



As to sky conditions, early on, there were a few thin cirrus clouds that added a “spooky” effect over the partially eclipsed moon, but after 5:15, it was clear. Looking about the rest of the sky, Orion and Taurus were getting ready to set and Leo was high on the meridian, with beautiful red-orange Mars resting beneath his belly. Brilliant orange Arcturus was high in the eastern sky, mimicking Mars’ color. To the southeast, Spica and Saturn appeared like twins, with one sparkling and the other giving off a steady light. Aside from some crowing roosters in the neighborhood, it was a very quiet and peaceful morn.

The temperature was around 50 degrees and there was no wind, so it was chilly but not too uncomfortable. Totality began at 6:08 and sunrise was less than forty minutes away, so the sky was brightening considerably. I had hoped to observe the eclipsed moon set over the San Gabriel Mountains, but there were thickening clouds low on the horizon that obscured it just before moonset. The evening before, I had watched the full moon rise over the San Bernardino Mountains and had hoped to “bookend” the night by watching the eclipsed moon set over the other side of mountains.

To insure a good view of the eclipse as it lowered in the northwest, I climbed up onto the roof of my house to get an unobstructed view of the horizon. Leaning against my “swamp cooler” I was able to steadily hold my bins and enjoy the spectacle.

Another household ‘creature comfort’ also handily came into play, I could warm my chilled fingers over the furnace vent!

The silhouetted San Bernardino Mountains were beautiful to see in the brightening morning twilight as well. Almost suddenly, by 6:20, it was daylight and the moon was gone! For those lucky observers scattered further west across the Pacific and Asia, they were still able to watch the rest of the eclipse, but we were through. With that, I got down from the roof, went back inside and gave the cats their breakfast and then toddled off to Coco’s for a nice hot breakfast of my own. The sun was now beaming bright and the eclipse just a memory.

You know, there is something serene and magical about watching an eclipse. Focusing on the “line-up of worlds” takes your mind off of all the big and little matters that we deal with everyday and gives you a much greater perspective to ponder. This eclipse was also worth getting up extra early to see since the next total lunar eclipse won’t happen for another three years.

For those of you who missed it, there will be a partial lunar eclipse (37%) visible in the “wee hours” next June 4. However, the really BIG treat will be the transit of Venus the very next day in the late afternoon! Also, there will be a partial solar eclipse (85%) visible late in the day on May 20. We haven’t seen a solar eclipse from here in about a decade, so it will be great fun to see one again. For “solar system observers,” it’s going to be an exciting two week period, that’s for sure!



## Eclipse Photos from Around the World



Arches Nat’l Park, Utah  
Julie Jacobson/AP



Hong Kong, China  
Soo Hoo Zheyang/Reuters



Beijing, China  
AndyWong/AP

### The Carnegie Observatories, Part 3

Large telescopes are custom-built and rare. There is no standard practice or model. Every time a large telescope is built, its designers must re-think the challenges, check every application, and improve on what has been done before.



The twin 6.5 meter Baade and Clay telescopes were built by the Carnegie Institution for Science at its Las Campanas Observatory in Chile on behalf of the Magellan Project, a collaborative effort by the Carnegie Institution, University of Arizona, Harvard University, University of Michigan, and Massachusetts Institute of Technology. The Magellan Consortium consists of more than 200 senior astronomers, 100 postdoctoral astronomers, and nearly 100 Ph.D. students. Each partner has its own scientific agenda for the telescopes and assigns its share of telescope usage.



The Magellan main mirrors are  $f/1.25$  paraboloids and a radical departure from the nearly solid glass mirrors of the past. Each is 21,000 pounds of borosilicate glass with a lightweight honeycomb structure inside. It took 6 months to build the mold for each mirror, 2 days to fill it with chunks of glass, 1 week to melt the glass and spin it into shape (in a

specially designed rotating oven), and 3 months for the glass to cool. Each was then polished for 8 months while its surface was constantly tested for accuracy. Relative to their size, the main mirrors are about as thin as a dime.

The aluminum surface of each mirror is a mere four-millionths of an inch (0.1 micron) thick. Each also sits in a "cell" that performs two important functions. First, the cell's thermal control systems prevent warping from thermal expansion and contraction. Second, the support systems in the cells maintain the mirrors in their proper shape, so there is no distortion or cracking. The actual shape of the mirror surface is controlled to within two-millionths of an inch (0.05 microns).

The telescopes float on a film of high-pressure oil on a 9 meter diameter circular track. To prevent slippage, the drive cylinders and drive surfaces are forced together with 10,000 pounds of pressure. Astronomical images are tracked to within 0.02 arcsecond in calm conditions. The telescopes themselves are so well balanced and frictionless that a gentle push from a child can move all their 150 tons.

The Magellan telescopes were designed with instrumentation as a foremost consideration. Astronomers use instruments, such as high-end CCD cameras and spectrographs, to record and analyze incoming light. The instrument platforms at Magellan permit rapid switching between different optical configurations in order to take advantage of changing weather, seeing, or moonlight conditions. Some of the vital instruments operation on the Magellan telescopes include the infrared imager known as PANIC, the Magellan Inamori Kyocera Echelle (MIKE), and the Inamori Magellan Areal Camera and Spectrograph (IMACS), a very versatile wide-field imager and multi-object spectrograph.

The Magellan telescopes began operations in the early part of this decade and have already contributed new data and insights to a wide range of topics in astronomy, cosmology, and astrophysics.