



# THE STAR DIAGONAL

THE JOURNAL OF THE OGDEN ASTRONOMICAL SOCIETY



## OAS Executive Committee

President - Lee Priest - (801) 479-5803  
[LeVae@aol.com](mailto:LeVae@aol.com)

Vice Pres- Ron Vanderhule - (801) 726-8554  
[deepsky100@msn.com](mailto:deepsky100@msn.com)

Secretary- David Dunn - (801) 544-7705  
[dunndave@aol.com](mailto:dunndave@aol.com)

Treasurer- Doug Say - (801) 731-7324  
[dougsay@comcast.net](mailto:dougsay@comcast.net)

Past Pres- Craig Browne - (801) 388-6556  
[cbrowne@Readytek.net](mailto:cbrowne@Readytek.net)

ALCOR- Dustin Klein - (801) 309-5471  
[red8968@msn.com](mailto:red8968@msn.com)

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## Connect with Us

Web: <http://ogdenastronomy.com/>

Private Email Group: [OAS\\_News@yahoogroups.com](mailto:OAS_News@yahoogroups.com)

Email: [OgdenOAS@gmail.com](mailto:OgdenOAS@gmail.com)

Twitter: @OgdenOAS

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## Meeting Announcement

Our Annual meeting of the Ogden Astronomical Society will be held on October 9, 2014 at 7:30pm at the Ott Planetarium.

## President's Message

I would like to welcome everyone to a new year with OAS and its continued success. With elections, or at least appointments, over I am happy to be your new president and welcome Ron, Dave, Doug, Craig and Dustin to another year on the executive committee. We will get together in December and plan out next year's activities, if you have any suggestions for star parties or other activities let me know.

The basic outline should be monthly meetings at the Planetarium through May, the family social and barbecue in June and the Monte Cristo camp outs July and August. A new addition to our activities will be the Great Basin Astronomy Festival in

September. The park rangers have put together a fun and informative program and it is a great opportunity to view in some of the darkest skies in the country.

One of the more challenging aspects of being president is coming up with meaningful meeting topics and presenters. I would like to invite everyone willing to take some time and talk at one of our meetings even if you only want to do 15 or 20 minutes we would love to hear from you. If you need help putting together a presentation we would be happy to help out. For the October meeting I will show the slides and audio from the August Night Sky Network telecom on "Asteroids, Ion Propulsion, and NASA's Dawn Mission presented by Dr. David A. Williams of the School of Earth & Space Exploration, Arizona State University. We hope to see you there.

Thanks,  
Lee Priest

## Star Party Schedule

Public Star Parties are as follows.

Oct 18            Antelope Island

Our Requested Star Parties (Schools, etc).

Our Private Star Parties are as follows.

Oct 24-26            Curlew

### Park City Girl Scout's Star Party

We have a star party for the Girl Scouts in Park City on September 5<sup>th</sup>. Go on I-80 to I-40 toward Heber. Take the Silver Summit exit and turn right. Go about 2 miles, go thru the stop sign and that is the place. The girls are getting a badge for this and the emphasis will be on the Moon and Polaris. We should meet there about 8:00 as sunset is around 8:45. I will be the point man on this and make your "reservations" via OAS\_news. They anticipate approx. 75 people. As always the event is weather contingent.

Ron

### Great Basin National Park Astronomy Festival Report

It was great! Alice and I were there from Thursday afternoon until Saturday afternoon. We were somewhat rushed Thursday because we got there around 4pm PDT. We had to sign the govt. volunteer forms and park the trailer so that we could get back for a mandatory safety mtg. at 5pm.

I grabbed a quick bite to eat and then got my telescope set up by about 7pm.

The sky was great Thursday and Friday night. I couldn't really see much if any light from any cities. There was perhaps just a bit from Las Vegas. There were a lot of people both nights so I spent 1 1/2 hours Thursday on Albireo and about 2 hours Friday showing M27.

The visitors always left by around 10pm so there is plenty of time to observe what you want after that -

if you aren't wiped out tired. You can't turn on white lights until around midnight.

They are okay with lasers - but they need to be low power. So, next year I will bring my 5mW.

Friday morning we went on the cave tour and Friday afternoon I set up my solar scope and scope with white light filter at the lower visitor center. There was an incredible prominence! It was the best one that I have seen. I was able to show the sun to about 40 or so people.

They provided a really nice dinner for us Friday.

Saturday morning we went for a drive and short hike at the 10,000 ft. level with Lee and Carol.

I'm looking forward to next September, but I think it would be good to get there earlier to avoid being rushed.

Clear skies,  
Dale.

### Twinkle, twinkle, variable star

By Dr. Ethan Siegel

As bright and steady as they appear, the stars in our sky won't shine forever. The steady brilliance of these sources of light is powered by a tumultuous interior, where nuclear processes fuse light elements and isotopes into heavier ones. Because the heavier nuclei up to iron (Fe), have a greater binding energies-per-nucleon, each reaction results in a slight reduction of the star's mass, converting it into energy via Einstein's famous equation relating changes in mass and energy output,  $E = mc^2$ . Over timescales of tens of thousands of years, that energy migrates to the star's photosphere, where it's emitted out into the universe as starlight.

There's only a finite amount of fuel in there, and when stars run out, the interior contracts and heats up, often enabling heavier elements to burn at even higher temperatures, and causing sun-like stars to grow into red giants. Even though the cores of both hydrogen-burning and helium-burning stars have consistent, steady energy outputs, our sun's overall

brightness varies by just ~0.1%, while red giants can have their brightness's vary by factors of thousands or more over the course of a single year! In fact, the first periodic or pulsating variable star ever discovered—Mira (omicron Ceti)—behaves exactly in this way.

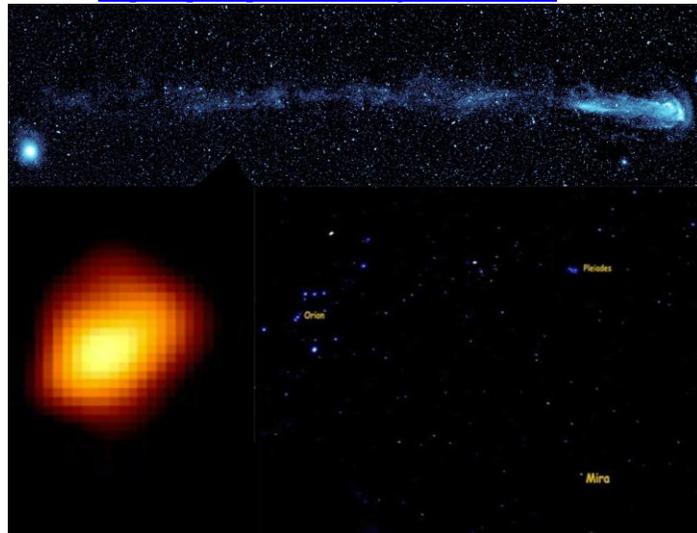
There are many types of variable stars, including Cepheids, RR Lyrae, cataclysmic variables and more, but it's the Mira-type variables that give us a glimpse into our Sun's likely future. In general, the cores of stars burn through their fuel in a very consistent fashion, but in the case of pulsating variable stars the outer layers of stellar atmospheres vary. Initially heating up and expanding, they overshoot equilibrium, reach a maximum size, cool, then often forming neutral molecules that behave as light-blocking dust, with the dust then falling back to the star, ionizing and starting the whole process over again. This temporarily neutral dust absorbs the visible light from the star and re-emits it, but as infrared radiation, which is invisible to our eyes. In the case of Mira (and many red giants), it's Titanium Monoxide (TiO) that causes it to dim so severely, from a maximum magnitude of +2 or +3 (clearly visible to the naked eye) to a minimum of +9 or +10, requiring a telescope (and an experienced observer) to find!

Visible in the constellation of Cetus during the fall-and-winter from the Northern Hemisphere, Mira is presently at magnitude +7 and headed towards its minimum, but will reach its maximum brightness again in May of next year and every 332 days thereafter. Shockingly, Mira contains a huge, 13 light-year-long tail -- visible only in the UV -- that it leaves as it rockets through the interstellar medium at 130 km/sec! Look for it in your skies all winter long, and contribute your results to the AAVSO (American Association of Variable Star Observers) International Database to help study its long-term behavior!

*Check out some cool images and simulated animations of Mira here:*

[http://www.nasa.gov/mission\\_pages/galex/20070815/v.html](http://www.nasa.gov/mission_pages/galex/20070815/v.html)

*Kids can learn all about Mira at NASA's Space Place: <http://spaceplace.nasa.gov/mira/en/>*

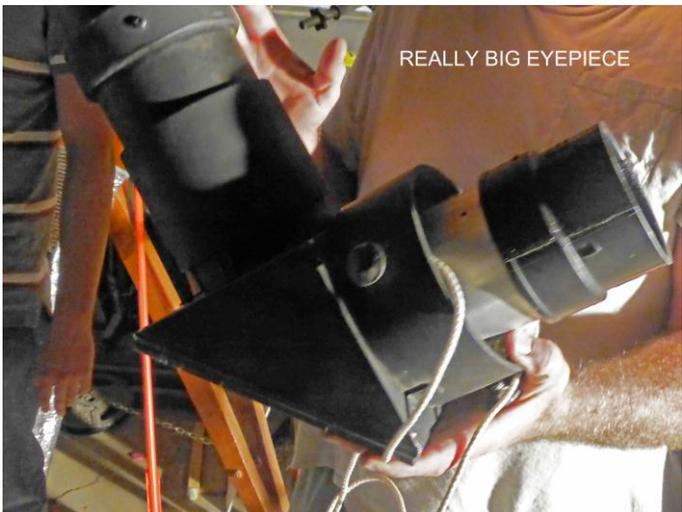
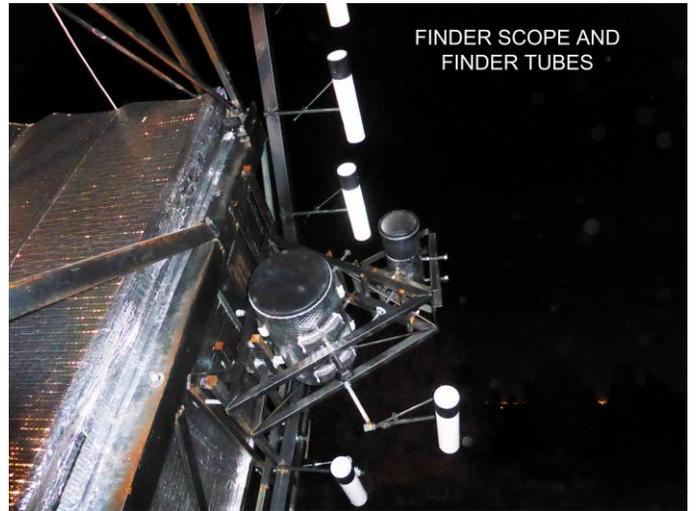


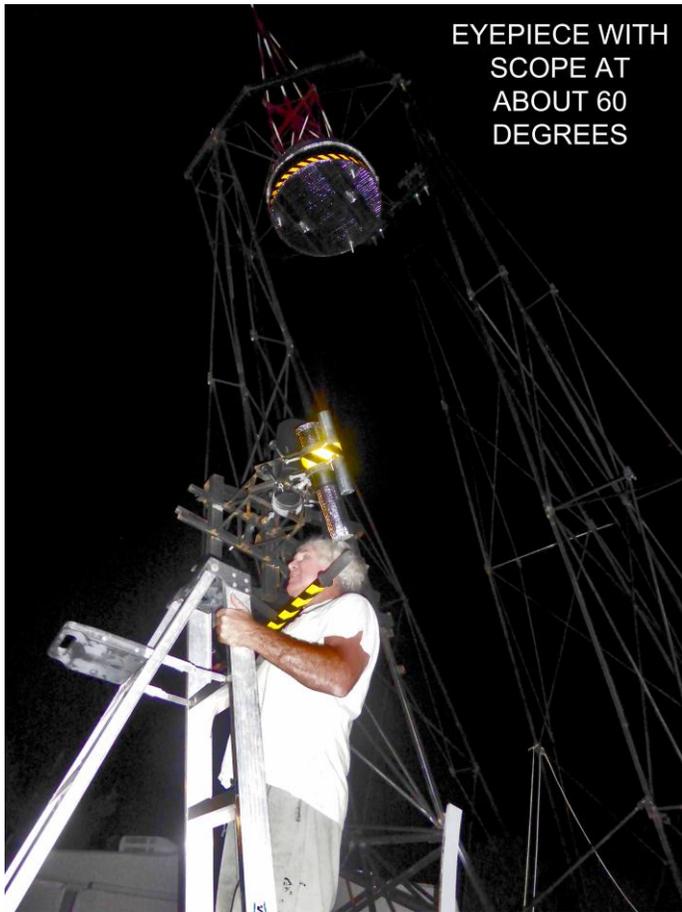
*Images credit: NASA's Galaxy Evolution Explorer (GALEX) spacecraft, of Mira and its tail in UV light (top); Margarita Karovska (Harvard-Smithsonian CfA) / NASA's Hubble Space Telescope image of Mira, with the distortions revealing the presence of a binary companion (lower left); public domain image of Orion, the Pleiades and Mira (near maximum brightness) by Brocken Inaglory of Wikimedia Commons under CC-BY-SA-3.0 (lower right).*

## **Pictures of Mike's 70"**

By Aaron Barson



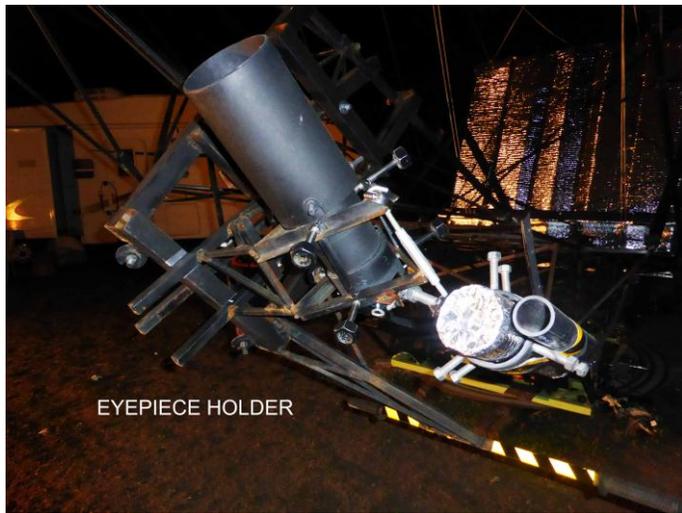




EYEPIECE WITH  
SCOPE AT  
ABOUT 60  
DEGREES



NEW DRIVE CONTROLLER



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