

IO - February 2010

Eugene Astronomical Society
Annual Club Dues \$25
President: Sam Pitts - 688-7330
Secretary: Jerry Oltion - 343-4758
Additional Board members:
Jacob Strandlien, Tony Dandurand,
John Loper.

www.eugeneastro.org

EAS is a proud member of:

The Astronomical League
The World's Largest Federation of Amateur Astronomers

Issue 2010-02
Eugene Astronomical Society

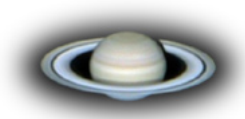


Next Meeting: Thursday, February 25th

Aperture Fever, by Sam Pitts

At our February meeting, Sam Pitts will talk about the impulse to buy or build bigger and bigger telescopes to look at fainter and fainter objects. What's the practical limit? What are the advantages and disadvantages to large aperture scopes? When might a smaller scope be a better choice? Come hear Sam's take on the subject and see examples of the relative extremes we go to in our search for ever more elusive photons.

In addition to Sam's talk, Jacob Strandlien will also present the astronomy news of the month, and as always we encourage people to bring any new gear or projects they would like to show the rest of the club. The meeting is at 7:00 in EWEB's Community Room, 500 E. 4th in Eugene.



Next First Quarter Friday: February 19th

Our January First Quarter Friday (January 22nd) was a small affair: just two telescopes peeking through sucker holes for an hour before the clouds rolled in for good, but there were about 10 very enthusiastic observers to share the view through Bill's and Kathy & Jerry's telescopes. We'll try it again on February 19th, and with any luck we'll have more sky, more scopes, and more people.

First Quarter Fridays are laid-back opportunities to do some observing and promote astronomy at the same time. Mark your calendar and bring your scope to the College Hill Reservoir (24th and Lawrence in Eugene) and share the view with whoever shows up.

Here are the dates for First Quarter Fridays through December of 2010.

February 19
March 19
April 23
May 21

June 18
July 16
August 13
September 17

October 15
November 12
December 10

January Meeting Report

Our January 28th meeting was a huge success. The *Register-Guard* mentioned our telescope workshop on two separate days, and people came out of the woodwork with telescopes and questions for EAS members to help them with. The seating filled quickly and people wound up standing along the back and side walls. It was hard to get an accurate count as people kept coming and going, but Sam tallied 70 at one point.

The meeting started with a “What’s Out There” astronomy program by Rick Kang, who pointed out the landmark constellations for various seasons and what’s there to look at with a telescope. Rick went into some basic astrophysics on the scale of the solar system, the Milky Way Galaxy, and the entire universe.

After Rick’s talk, Eric Gross gave a short presentation on the “Cross Quarters,” the midpoints of each official season, which used to mark major celebration dates that we still celebrate in altered form today. (Think Groundhog’s Day, Mother’s Day, and Halloween.)

After Eric’s talk we opened up the floor for the telescope workshop, and man, did we have a bunch of scopes to help people with. There were scopes from dimestore refractors (always a challenge to help with, since so many are beyond help) to a venerable old 8" Celestron Schmidt-Cassegrain that needed collimation after a bumpy trip across the country. We did what we could, and we hope everyone went away happy.

We gained three new members: Louis English, John Yoder, and Kirk Taylor. Welcome! We hope to see you out under clear skies sometime soon.



Standing room only at our January 28th meeting



Our next meeting will be on Thursday, February 25th, at 7:00 PM in the north building’s Community Room. This is the first room in the semicircular building to the north of the fountain at EWEB’s main campus on the east end of 4th Avenue.

Meeting dates for 2010: (All meetings are at 7:00 in the Community Room)

February 25

May 27

August 26

November 24

March 25

June 24

September 23

December 23

April 22

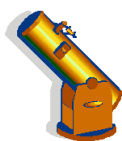
July 22

October 28

Thank You Castle Storage



For nearly two years now, Castle Storage has generously provided EAS a place to store its telescopes and equipment. EAS would like to thank Castle Storage for their generosity and support for our group. Please give them a call if you need a storage space, and tell your friends. They are great people and offer secure and quality storage units.



Observing in February



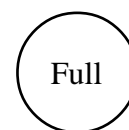
Last Q



New



1st Q



Full

February 5	February 13	February 21	February 28
Mercury Rise: 6:19 AM	Mercury Rise: 6:28 AM	Mercury Rise 6:34 AM	Mercury Rise 6:37 AM
Venus Set: 5:55 PM	Venus Set: 6:16 PM	Venus Set 6:38 PM	Venus Set: 6:56 PM
Mars Set: 7:33 AM	Mars Set: 6:52 AM	Mars Set: 6:13 AM	Mars Set: 5:41 AM
Jupiter Set: 6:55 PM	Jupiter Set: 6:34 PM	Jupiter Set: 6:12 PM	Jupiter behind Sun
Saturn Rise: 9:21 PM	Saturn Rise: 8:48 PM	Saturn Rise: 8:14 PM	Saturn Rise: 7:44 PM
Uranus Set: 8:40 PM	Uranus Set: 8:11 PM	Uranus Set: 7:42 PM	Uranus Set: 7:16 PM
Neptune Set: 6:11 PM	Neptune behind Sun	Neptune behind Sun	Neptune Rise: 6:24 AM
Pluto Rise: 4:40 AM	Pluto Rise: 4:09 AM	Pluto Rise: 3:39 AM	Pluto Rise: 3:12 AM

All times: Pacific Standard Time (Nov 1, 2009-March 13, 2010) = UT -8 hours or U.S. Pacific Daylight Time (March 14-November 7, 2010) = UT -7 hours.

Date	Moonrise	Moonset	Sunrise	Sunset	Twilight Begin	Twilight End
2/1/2010	21:06	08:34	07:30	17:23	05:51	19:02
2/2/2010	22:23	08:59	07:29	17:24	05:50	19:03
2/3/2010	23:37	09:24	07:27	17:26	05:49	19:04
2/4/2010		09:52	07:26	17:27	05:48	19:06
2/5/2010	00:50	10:23	07:25	17:28	05:47	19:07
2/6/2010	01:59	11:00	07:24	17:30	05:46	19:08
2/7/2010	03:03	11:43	07:23	17:31	05:45	19:09
2/8/2010	04:00	12:34	07:21	17:32	05:43	19:10
2/9/2010	04:48	13:30	07:20	17:34	05:42	19:12
2/10/2010	05:28	14:31	07:19	17:35	05:41	19:13
2/11/2010	06:02	15:33	07:17	17:37	05:40	19:14
2/12/2010	06:29	16:36	07:16	17:38	05:39	19:15
2/13/2010	06:53	17:39	07:14	17:39	05:37	19:17
2/14/2010	07:14	18:40	07:13	17:41	05:36	19:18
2/15/2010	07:34	19:42	07:11	17:42	05:35	19:19
2/16/2010	07:53	20:44	07:10	17:44	05:33	19:20
2/17/2010	08:14	21:48	07:08	17:45	05:32	19:22
2/18/2010	08:36	22:54	07:07	17:46	05:30	19:23
2/19/2010	09:01		07:05	17:48	05:29	19:24
2/20/2010	09:33	00:01	07:04	17:49	05:28	19:25
2/21/2010	10:11	01:09	07:02	17:50	05:26	19:27
2/22/2010	11:00	02:16	07:01	17:52	05:25	19:28
2/23/2010	12:01	03:17	06:59	17:53	05:23	19:29
2/24/2010	13:12	04:11	06:58	17:54	05:21	19:30
2/25/2010	14:31	04:56	06:56	17:56	05:20	19:32
2/26/2010	15:53	05:33	06:54	17:57	05:18	19:33
2/27/2010	17:14	06:04	06:53	17:58	05:17	19:34
2/28/2010	18:35	06:32	06:51	18:00	05:15	19:36

Items of Interest This Month

Last good month for observing Mars
 Good month for observing Vesta (in Leo)
 Saturn becoming visible in late evening
 2/4 Mars passes 3° north of Beehive Cluster
 2/14 Venus, Jupiter, and Moon conjunction (very close to the horizon after sunset)
 2/16 Venus & Jupiter within 1/2°
 2/16 Vesta passes between gamma and 40 Leonis
 2/17 Saturn's moon Iapetus at its most visible (west of the planet)
2/19 First Quarter Friday Star Party
 2/22 Moon 5° below Mars

For Current Occultation Information

Visit Derek C. Breit's web site

"BREIT IDEAS Observatory"

<http://www.poyntsource.com/New/Regions/EAS.htm>

Go to Regional Events and click on the Eugene, Oregon section. This will take you to a current list of Lunar & asteroid events for the Eugene area. Breit continues to update and add to his site weekly if not daily. This is a site to place in your favorites list and visit often.

All times are for Eugene, Oregon, Latitude 44° 3' Longitude 123° 06' for listed date

Observing Highlight: The Eskimo Nebula

The Eskimo Nebula, also known as the Clown Face Nebula or NGC 2392, is an often overlooked planetary nebula in Gemini. People tend to give it a miss because it's small and difficult to find, but a little patience brings a great reward: It's one of the few planetary nebulae in which you can see two distinct shells of gas, plus the central star.

The Eskimo Nebula is one of the youngest planetary nebulae known. Its outer gas shell probably left its central star only 1,500 years ago, yet in that time it has expanded to a diameter of about one-third of a light-year. Two distinct expulsion events give it a double-ring appearance that in a large telescope or in photographs looks like a face inside a fur-lined parka.

It sits just off the left (our left) hip of Gemini. Look about halfway between the stars Kappa (κ) and Lambda (λ) Geminorum, about 1° southeast of the wide double star 63 Geminorum. The nebula lies very near a star of similar (8th) magnitude, and at low power it looks like little more than a slightly out-of-focus star. However, increased magnification and a little patience bring out some interesting details. You can see the two different shells of gas, and with enough magnification and aperture you can see a hint of structure to the inner shell, plus the central star.

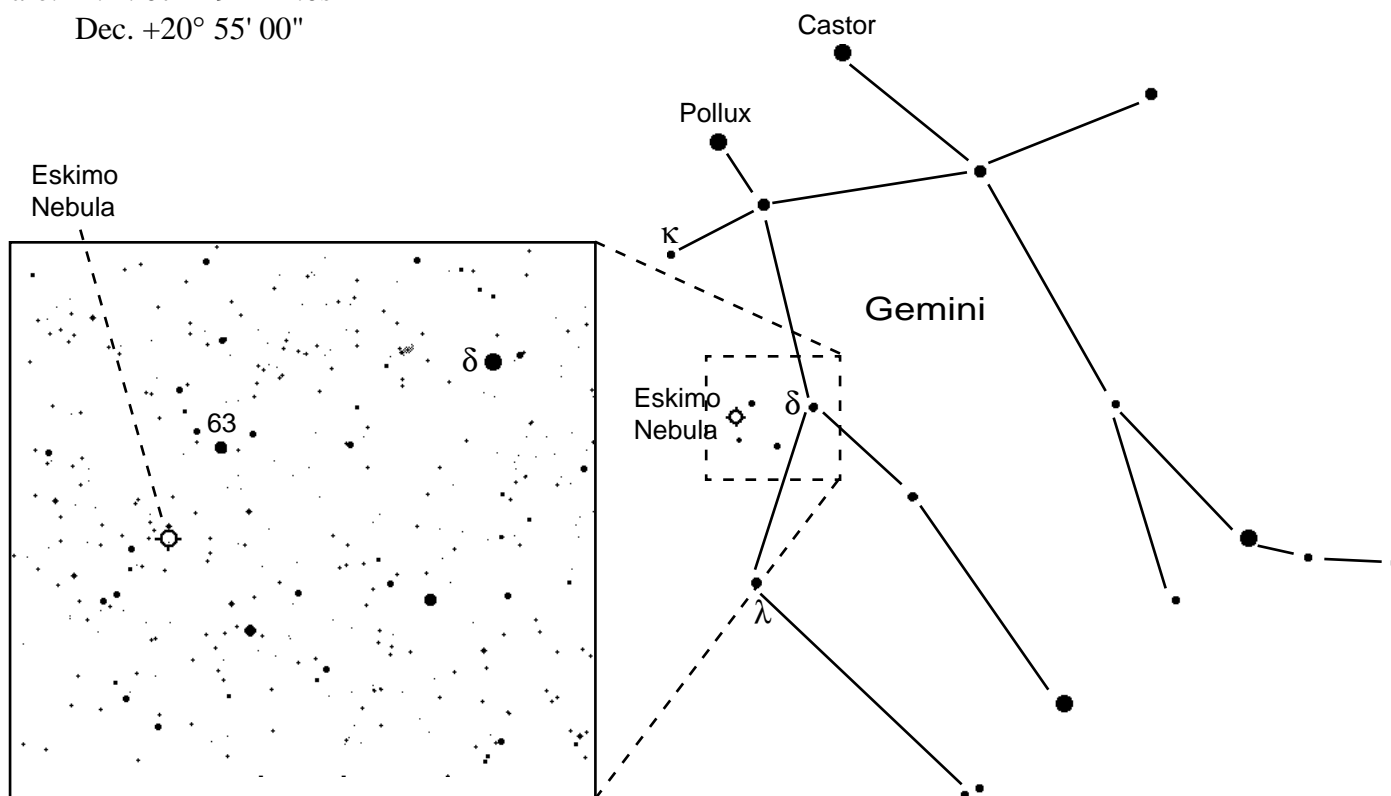
The Eskimo Nebula is about 40 arc-seconds wide, so you definitely want high power to study it well, but it's distinguishable as a nebula even at 40 power or so if you look carefully.

For go-to-ers and setting circle users, the coordinates are: R.A. 07h 29m 12.0s

Dec. $+20^\circ 55' 00''$



A high-magnification view through a 10-12" scope



A Tour of Optic Wave Laboratories

by Jerry Oltion

On Saturday, January 16, EAS members Jacob Strandlien and Jerry Oltion took a road trip to Optic Wave Laboratories in Gold River, just east of Sacramento. They went down to pick up the club's 18" mirror that had been refigured and recoated and to take Jerry's recently finished 12.5" mirror for coating.

OWL owner Cary Chleborad generously agreed to test and coat Jerry's mirror while they waited, and also gave them a tour of the testing, polishing, and coating lab.

In a word: Wow! OWL is every amateur telescope maker's dream. Next door to the optics lab Cary has a machine shop with fully automated mill and lathe equipment. His crew was busy mass-producing telescope parts while we watched. Had Tom (our resident machinist) been there, the tour would probably have gone no farther, but we continued into the testing area, where Cary put Jerry's mirror on the stand and proceeded to tell him the sad news: his baby was about 1/3-wave at best.



Cary Chleborad and his testing setup

OWL has an amazing polishing lab where mirrors that don't test well can be refigured to 1/8-wave or better accuracy. Jerry faced an ATMer's dilemma: go with it as-is, or have Cary refigure it?



Three polishing machines in the mirror refiguring area

Refiguring would take more time than he and Jacob had, which would mean leaving the mirror and either driving down again next weekend or having the mirror shipped home. In either case, there would be no demonstration of the coating process that day.

The star test had been pretty good, so Jerry decided to have it coated anyway. And the experience alone was worth the \$100 coating fee. Cary scrubbed the mirror clean with ethanol to remove any trace of contamination, then mounted the mirror upside down inside the coating chamber. Beneath the mirror sat two crucibles, one of aluminum and one of silicon dioxide. After securing the mirror in place on an alarmingly minimalist armature ("Nervous yet?" Cary asked Jerry), Cary sealed the door and started the vacuum pump, which quickly drew the pressure down from 760 millimeters of mercury (one atmosphere) to less than one mm. If that were sufficient, the coating process could have been over in a few minutes, but 1mm

of mercury is way too much air. When the pressure dropped to about 0.1mm, an internal door opened, exposing a “cold trap,” a metal plate cooled by liquid helium to just a few degrees above absolute zero. Any molecules of air left in the chamber that hit the cold trap lost their high-temperature momentum and stuck to the metal plate, dropping the pressure to less than 0.05mm. Still not enough! Cary left the vacuum pump running and the cold trap exposed for another hour, until the pressure was next to nothing.



Jerry's mirror mounted in the vacuum chamber

the aluminum crucible and vaporized aluminum shot upward, coating the mirror in just a couple of minutes. When the proper thickness of aluminum had been deposited, another electron beam melted the silicon dioxide overcoating, sealing the aluminum to prevent oxidation and providing a protective overcoat.



Jerry's mirror being coated



The vacuum chamber

Then he activated the electron beam that melted the aluminum in the crucible. Jerry and Jacob were able to watch through a tiny porthole while the electron beam looped around under the influence of powerful electromagnets and melted the aluminum. When it was good and hot, Cary opened the shutter above



The aluminum and silicon dioxide crucibles

At this point enhanced coatings could be applied to boost reflectivity. It's all in the thickness and number of silicon dioxide coatings, which build up constructive interference layers that kill internal reflections and increase the amount of light that makes it back through the coatings to the eyepiece.

Jerry opted for the basic (89% reflective) coating, so the deposition process was finished after the single layer of silicon dioxide.

Opening the vacuum chamber revealed the coated mirror. “It’s all downhill from here,” Cary said as the first molecules of air — and the inevitable dust particles — hit the freshly aluminized surface.

With that, Jacob and Jerry packed up the two mirrors and hit the road again, singing old Beatles tunes at top volume to stay awake on the long drive home. But Jerry, at least, didn’t sleep much even after he got home. Visions of the polishing, testing, and coating lab kept dancing in his head all night. OWL is a seriously cool operation!



Cary with Jerry’s freshly coated mirror

EAS Receives Big Mirror Donation

At our January 28th meeting, past EAS president Noel Berkeley donated a 12.5" full-thickness Pyrex mirror to the club. The mirror has already been ground to f/4.75 and partially polished, and only needs a few more hours of work before parabolizing and coating. It comes with a 9-point flotation cell made from an old Volkswagen wheel. The cell is curved into a hemisphere that just screams out “trackball!”

But there’s an interesting wrinkle: Jerry Olton’s mirror that he just got coated (see above article) has almost the same focal length. The new mirror is only 1.5" longer in focal length, a difference that could be shortened to zero with a little extra work.

Can you say “Really big binocular scope”? It would be a lot of work, not only to build but to move around, but it would produce some awesome views and would be a seriously cool asset for the club.

So would a 12.5" f/4.75 scope in its own right, whether it be a trackball or a more conventional Dobsonian. Such a scope might get used more than a big, cumbersome binocular scope. What do you think? If you have a strong opinion one way or the other, let Jerry know. He’s not committing to anything at this point other than to finish up the mirror, but your thoughts on the subject will help direct the project and the eventual use of the mirror.

In the meantime, a big Thank You to Noel Berkeley for donating the mirror to the club!



The new 12.5" mirror in its Volkswagen-wheel cell

A Classic Telescope Changes Hands

In 1990, Mel Bartels ground a 20" f/5 mirror, working on its figure until it was one of the best mirrors he has ever made, before or since. He built a more or less standard Dobsonian mount for it and used that scope for several years, but the scope was bulky and hard to transport. In 2000, Mel decided to build a more portable scope to house the mirror. Thus was born the “Tri-Dob,” an incredibly lightweight and portable telescope that has wowed observers at the Oregon Star Party for years and was featured in *Sky & Telescope* magazine in August of 2004.

The name comes from the many triangles inherent in its construction, which add stability without weight. Mel built the Tri-Dob with a motorhome door in mind, and indeed the bulkiest component — the mirror box — can be carried with ease through a two-foot doorway.

It turns out the entire scope can also fit into a Volkswagen Beetle. Therein lay the crucial factor in its recent change of hands. Mel wanted to sell the Tri-Dob to finance an even bigger telescope project: a 30" f/3. Jerry and Kathy Oltion wanted to buy a big scope, but they drive a Volkswagen. When they determined that the Tri-Dob would indeed fit in their car, all that was left was the



Jerry, Kathy, and Mel with the Tri-Dob

haggling over price. Mel and Jerry and Kathy eventually settled on a figure that made them all wince about equally, and thus the venerable Tri-Dob went to live with the Oltions, who have vowed to treat it like any other grab-and-go telescope.

Indeed, it goes into and out of the car as easily as just about any scope, and it takes only ten minutes to set up. You will see this scope out often, and Jerry and Kathy will be happy to share the view through it.



The Tri-Dob in a Volkswagen Beetle, with room to spare!