

IO - August 2011

Issue 2011-08
Eugene Astronomical Society

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



Next Meeting: Thursday, August 25th

Subject to be Announced

We don't yet have a speaker lined up for our August meeting, so we'll announce that online when someone volunteers. Consider giving a talk to the club on your favorite aspect of amateur astronomy, or some other astronomy-related topic that you have some experience with. We're a forgiving crowd, and eager to learn from each other. If you'd like to volunteer to speak, contact Sam or Jerry.

In addition to whatever program we come up with, Jacob Strandlien will present the astronomical news of the month. We also 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 on July 28th at EWEB's Community Room, 500 E. 4th in Eugene.

Relay for Life Star Party Report

In the wee hours of the morning on July 30th (2:00 a.m. thru 3:30 a.m.) the EAS provided a star party during the 24-hour "Relay for Life" event at Willamette High School. Jerry & Kathy Oltion and Richard Boyd brought scopes to the event and despite severe light pollution managed to show about 30 people some highlights. Jupiter was a clear favorite, as were Albireo, M13, and the Andromeda Galaxy.

Next First Quarter Friday: August 5th

Our July star party was clear for a change and well attended. We had half a dozen or more telescopes and maybe 50+ observers. One family was so enthusiastic that Frank Szczepanski nearly gave his telescope to them until he realized it had a damaged mirror.

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 2011, along with the percentage of the Moon's disk that's lit on each night so we can consider in advance what other sights will be visible to show people. Since the star party seldom falls right on the first quarter, some of the phases are over 50% and some under.

August 5 (47% lit)
September 2 (33% lit)

October 7 (86% lit)
November 4 (74% lit)

December 2 (57% lit)
December 30 (39.7% lit)

July Meeting Report

At our July 28th meeting, Jerry Oltion gave us a tour of what's up in the summer sky now that we can finally see that sky, and we also watched a video of Sir Patrick Moore interviewing some curious characters for his "The Sky at Night" program. We learned how to speak Venusian and Plutonian, and we learned that the great Aetherius is watching over us from Venus. Whew!

After the video we listened to a short explanation of hydrogen fusion from a Teaching Company lecture that Paul Swadener brought with him, and Jacob Strandlien gave us the astronomical news for the month.

Our next meeting will be on Thursday, August 25th, at 7:00 PM in the EWEB 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 2011: (All meetings are at 7:00 in the Community Room)

August 25
September 22

October 27
November 10

December 22

Jerry's Big Astroscan Featured in *Sky & Telescope*

The September issue of *Sky & Telescope* magazine contains an article about Jerry Oltion's 2x scaled-up replica of the Edmund Scientific Astroscan. Check it out, and check out the web page Jerry made showing how he built it. Go to <http://www.sff.net/people/j.oltion/Astroscan.htm>

Telescope Lending Library

The EAS has several telescopes available for members to borrow. Check out the telescope lending page on our website to see the many scopes in our lending program, and contact Tony Dandurand, our lending coordinator, to arrange to check out one of these excellent scopes.

Tony can be reached via email at tdandurand@comcast.net or by phone at 541-726-8147.

For ongoing discussion of astronomical topics and impromptu planning of telescope outings, join the EAS mail list at <http://eugeneastro.org/mailman/listinfo/org.eugeneastro.general>



Thank You Castle Storage

For the last four years, 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.

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Dark-Sky Star Party Report

Our third annual Dark Sky Star Party was held on Saturday, July 23rd at Dexter State Park, about 15 miles southeast of Eugene on Highway 58. The weather cooperated with clear sky and steady seeing. We had about 16-18 telescopes and 150-200 people in attendance, and everyone seems to have had a great time. Dinah Landers and Diane Martin ran the welcome table at the end of the parking lot, so people knew the drill by the time they got to the telescopes. I didn't see a white-light flashlight or cell phone screen all night, to which I attribute pre-emptive education from the top of the hill.

This is rapidly becoming our signature annual blowout event. Many thanks to everyone who made it such a great success. We'll do it again next July!



Top: setting up for the star party at Dexter State Park. (You can zoom into this photo.)

Left: Bill Murray aligning his scope.



Lower left: Jerry Oltion and Tony Dandurand attempt to fix the fan on the club's 18" dob.

Below: Bob and Patrick Moser wait for the Sun to go down.

Photos courtesy of Ken Martin, Gordon & Dinah Landers.



Understanding Twilight

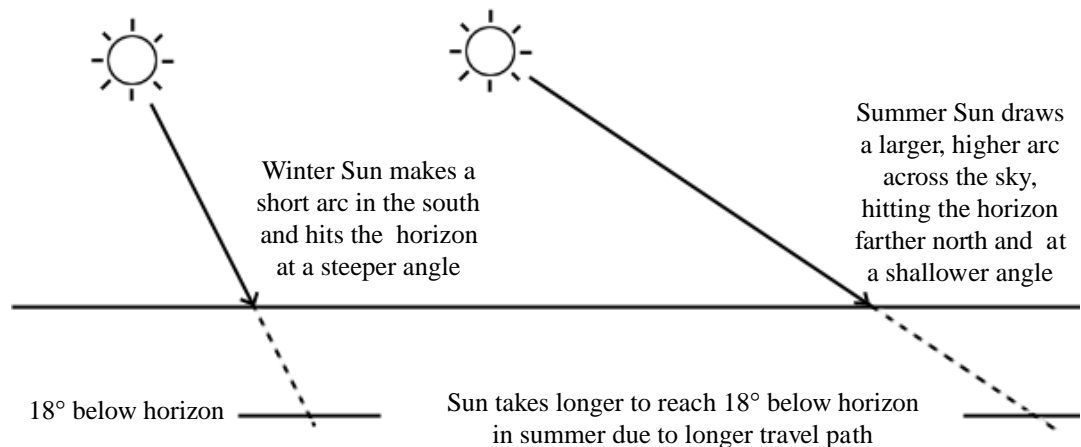
by Jerry Oltion

While compiling the table of astronomical data on p.6, I got to looking at the figures for sunset and twilight and wondered why twilight was so late in coming. On August 1st, the Sun sets at 20:37 and twilight doesn't end until 22:38, over two hours later. Yet astronomical twilight is defined as the moment when the center of the Sun is 18° below the horizon, and everybody knows that the Sun moves across the sky at 15° per hour, right? (It makes a full circle — 360° — in 24 hours, so it has to be moving 15° /hour.) At 15° /hour, twilight should arrive 1.2 hours after sunset no matter what, shouldn't it? So what gives?

A little digging through past data gives us a clue: At the June 21st solstice, twilight was two hours and 26 minutes after sunset. Last December at the winter solstice, twilight was only an hour and 45 minutes after sunset. (Don't trust the twilight numbers in the December 2010 *Io!* I accidentally corrected them for daylight savings time, which wasn't in effect then.)

So using the correct figures, we see that twilight takes longer to arrive in the summer than in the winter. Why is this?

It has to be the tilt of the Earth's axis. In the summer, we're tilting toward the Sun, and the Sun makes a higher arc across the sky. That means it hits the horizon farther north, and at a shallower angle. If it were diving directly downward, it would take 1.2 hours to reach the 18° twilight point, but it's hitting at an angle of almost 60 degrees, so it takes nearly twice as long to get that far below the horizon.



The curvature of the Earth adds another factor. To help visualize this, think of standing on the Arctic Circle in the summer. The Sun swirls around you all day, reaching 23.5° in height in the south at noon, then swinging down to just kiss the northern horizon at midnight. Now move a couple hundred miles south and watch what happens. The Sun rises a little bit higher at noon, and drops just below the horizon at midnight. It never reaches 18° below the horizon, though, so astronomical twilight never happens.

Keep moving south in your mind's eye, and you'll quickly see how it works. The farther south you go, the higher the Sun rises at noon, and it dives correspondingly deeper behind the horizon at midnight. When you reach our latitude of 44 degrees, the Sun rises quite high in the sky at noon (69°), but it still only dips 21° below the horizon at midnight. That means it only gets 3° below astronomical twilight and is approaching that point at a very shallow angle, which explains why it takes so long between sunset and twilight in the summer, and why full darkness doesn't last long.

In the winter, the situation is reversed. The Earth's north pole is tilted away from the Sun and the Sun makes a low arc across the daytime sky, making a correspondingly deep dive behind the planet at night. The angle it sets at is much steeper than in summer, so twilight is faster in arriving, and lasts longer.



Dawn Spacecraft Reaches Vesta

NASA's *Dawn* spacecraft reached Vesta and went into orbit on July 15th. It has been sending back photographs during its approach and since achieving orbit, revealing a battered, rocky body with plenty of geological details to keep astrogeologists busy for years to come



NASA's *Dawn* spacecraft took this image on July 23, 2011. It was taken from a distance of about 3,200 miles.

The most prominent feature is the south polar impact crater, which is 330 miles in diameter. It has a raised central mountain like many large impact craters, but little to no outer rim due to the crater's huge size relative to Vesta itself. Any material that would normally have formed a rim must have been blown off into space by the impact. Indeed, many meteorites that have fallen to Earth have been traced to Vesta, and may have come from that very impact.

Dawn will spend a year orbiting Vesta, then it will move on to Ceres, becoming the first spacecraft to orbit two aster — er, minor pla— er, dwarf planets. Surely by the time it gets there we'll have figured out what to call these things.

All images by NASA/JPL-Caltech/UCLA/MPS/DLR/IDA



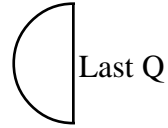
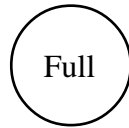
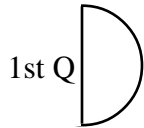
This was taken July 17th from a distance of about 9,500 miles. Each pixel in the image is about 0.88 miles.



This was taken July 18th from a distance of about 6,500 miles. The smallest detail visible is about 1.2 miles.



Observing in August



August 6	August 13	August 21	August 28
Mercury Set: 8:46 PM	Mercury Behind Sun	Mercury Rise: 5:54 AM	Mercury Rise: 5:13 AM
Venus Rise: 5:49 AM	Venus Behind Sun	Venus Set: 8:17 PM	Venus Set: 8:09 PM
Mars Rise: 2:38 AM	Mars Rise: 2:31 AM	Mars Rise: 2:24 AM	Mars Rise: 2:18 AM
Jupiter Rise: 11:44 PM	Jupiter Rise: 11:18 PM	Jupiter Rise: 10:47 PM	Jupiter Rise: 10:20 PM
Saturn Set: 10:54 PM	Saturn Set: 10:27 PM	Saturn Set: 9:57 PM	Saturn Set: 9:31 PM
Uranus Rise: 10:21 PM	Uranus Rise: 9:53 PM	Uranus Rise: 9:21 PM	Uranus Rise: 8:53 PM
Neptune Rise: 9:04 PM	Neptune Rise: 8:36 PM	Neptune Rise: 8:04 PM	Neptune Set: 6:08 AM
Pluto Set: 3:22 AM	Pluto Set: 2:54 AM	Pluto Set: 2:22 AM	Pluto Set: 1:54 AM

All times: Pacific Standard Time (Nov 6, 2011-March 10, 2012) = UT -8 hours or U.S. Pacific Daylight Time (March 13-November 5, 2011) = UT -7 hours.

Date	Moonrise	Moonset	Sunrise	Sunset	Twilight Begin	Twilight End
8/1/2011	08:29	21:25	06:00	20:37	03:58	22:38
8/2/2011	09:45	21:53	06:01	20:35	04:00	22:36
8/3/2011	11:00	22:22	06:02	20:34	04:02	22:34
8/4/2011	12:16	22:53	06:04	20:33	04:04	22:32
8/5/2011	13:31	23:29	06:05	20:31	04:06	22:30
8/6/2011	14:43		06:06	20:30	04:08	22:28
8/7/2011	15:52	00:10	06:07	20:29	04:09	22:25
8/8/2011	16:53	00:59	06:08	20:27	04:11	22:23
8/9/2011	17:45	01:55	06:09	20:26	04:13	22:21
8/10/2011	18:29	02:58	06:10	20:24	04:15	22:19
8/11/2011	19:05	04:03	06:11	20:23	04:17	22:17
8/12/2011	19:35	05:10	06:13	20:22	04:18	22:15
8/13/2011	20:02	06:15	06:14	20:20	04:20	22:13
8/14/2011	20:26	07:19	06:15	20:19	04:22	22:11
8/15/2011	20:48	08:22	06:16	20:17	04:24	22:09
8/16/2011	21:11	09:23	06:17	20:15	04:26	22:06
8/17/2011	21:34	10:24	06:18	20:14	04:27	22:04
8/18/2011	22:00	11:24	06:19	20:12	04:29	22:02
8/19/2011	22:28	12:25	06:21	20:11	04:31	22:00
8/20/2011	23:01	13:25	06:22	20:09	04:32	21:58
8/21/2011	23:41	14:25	06:23	20:07	04:34	21:56
8/22/2011		15:22	06:24	20:06	04:36	21:53
8/23/2011	00:28	16:15	06:25	20:04	04:37	21:51
8/24/2011	01:24	17:03	06:26	20:02	04:39	21:49
8/25/2011	02:27	17:45	06:27	20:01	04:41	21:47
8/26/2011	03:36	18:21	06:29	19:59	04:42	21:45
8/27/2011	04:50	18:54	06:30	19:57	04:44	21:43
8/28/2011	06:05	19:24	06:31	19:56	04:46	21:40
8/29/2011	07:22	19:53	06:32	19:54	04:47	21:38
8/30/2011	08:40	20:22	06:33	19:52	04:49	21:36
8/31/2011	09:58	20:54	06:34	19:50	04:50	21:34

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

Items of Interest This Month

All month: Vesta and Ceres visible in southeast.

8/5 First Quarter Friday Star Party

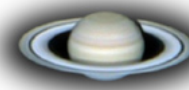
8/10 Io shadow transit 11:24 pm – 1:33 am 8/11

8/12 Peak of Perseid meteors, but unfortunately the Moon is nearly full.

8/22 Neptune at opposition.

8/27 Ganymede shadow transit 10:36 pm – 12:41 am 8/28

8/29 Europa shadow transit 12:37 am – 3:07 am.



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.