

Eugene Astronomical Society



www.eugeneastro.org

IO - August 2018

Eugene Astronomical Society
 Annual Club Dues \$25
 President: Diane Martin 541-554-8570
 Secretary: Jerry Olton 541-343-4758
 Additional Board members:
 Andrew Edelen, Oggie Golub, Jim
 Murray.

PO Box 7264
 Springfield, OR 97475
www.eugeneastro.org

EAS is a proud member of
 The Astronomical League



Next Meeting Thursday, August 16th Water, Water, Everywhere! by Al LePage

From comets and asteroids to Mars, from the Earth to the Moon, to the moons of the solar system's outer planets, from exoplanets to one of the oldest and largest water vapor clouds surrounding the black hole of a quasar some 12 billion light-years away... Yes, water is everywhere and has been around for a very long time. How does water form? Where did it all come from? How did Mars dry up? What's the history — and the future — of water on Earth? Where *is* water in the solar system? What's the "water cycle" for planets, moons, the universe? Why is finding water in the solar system and beyond so important? Dive into ocean worlds with EAS member Al LePage and swim through the universe to answer these and other questions of Astrohydrology!



Next First Quarter Friday: August 17th

Our July 20th star party was a great success, with 7 or 8 telescopes and 30 or 40 guests to look through them. We had Venus, Jupiter, Saturn, Mars, and the Moon to look at early on, and all the cool stuff in the Milky Way after it got darker. The temperature was perfect, the seeing good, and transparency as good as you can expect from town anymore. We stayed until well after 11:00.

Our next First Quarter Friday will be August 17th, but we have a couple other star parties between now and then. Check the following pages for more information about those.

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's the schedule for the rest of 2018. Star parties start at dusk or 6:00, whichever is later. (About 8:30 in August.)

August 17 (48% lit)
 November 9 (6% lit)

September 14 (32% lit)
 December 14 (46% lit)

October 12 (17% lit)

July 19th Meeting Report

Big Bear Solar Observatory and 3D Printing of Telescope Parts

At our July 19th meeting we had two presentations. Annette Brieske and Randy Beiderwell went first and talked about their visit to Big Bear Solar Observatory, a 1.6-meter solar telescope in the San Bernadino Mountains in southern California. They were given a private tour of this amazing instrument and shared their experience and their photos with us.

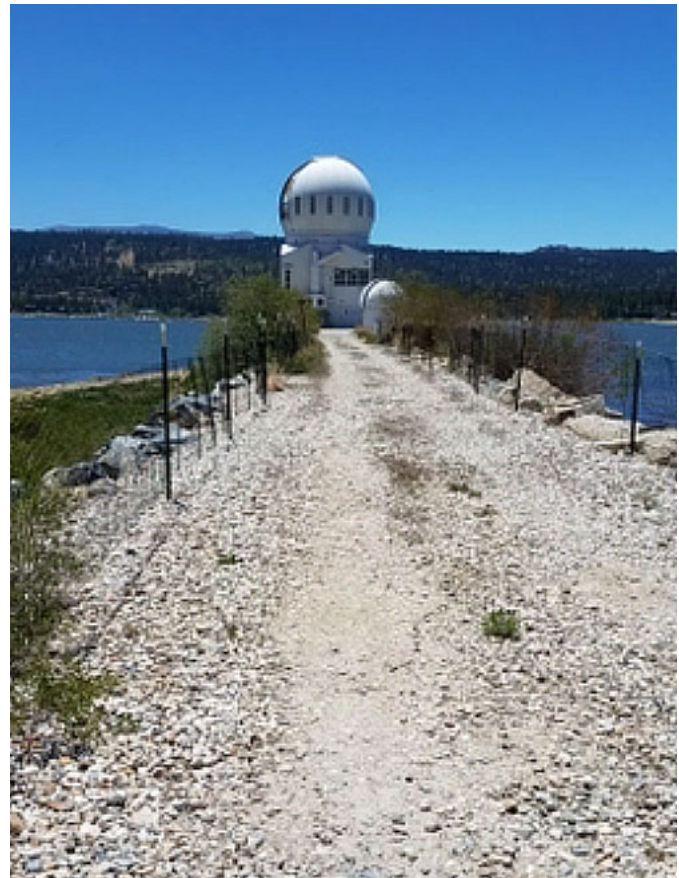
The observatory sits on a long causeway that extends out into Big Bear Lake, which provides a cool, even temperature that limits air turbulence around the telescope. Adaptive optics steady what turbulence remains, so the image obtained is incredibly sharp. The mirror was cut off-center from a much larger piece of glass, which means the secondary



Randy and Annette beneath the 1.6-meter mirror
Photo © by Randy Beiderwell.

Next up, Robert Asumendi talked to us about his experience in designing and 3D printing parts for the 8-inch binocular telescope he's building. Since Robert doesn't have a workshop, but he is pretty adept at computer-aided design, he is drawing out most of his scope electronically, then printing the parts and assembling them. He's using a carbon-fiber-infused material that offers great structural strength and rigidity, yet is extremely lightweight. His focuser weighs just a fraction of a commercial metal focuser with the same capabilities.

Robert showed us how 3D printing is done: in the most common method a printhead much like that on an inkjet printer travels back and forth in a horizontal plane, squirting out molten plastic at just the right moments to build up a solid object from the bottom upward. Another technique uses ultraviolet light to



The Big Bear Solar Observatory on its causeway.
Photo © by Randy Beiderwell.

mirror does not obstruct the primary mirror, further increasing its resolving power. As a result, the scope can resolve solar features as small as 30 miles across. Until the Daniel Inouye telescope in Hawaii is completed, BBSO remains the largest clear-aperture solar telescope in the world.

This scope is amazing, and Annette and Randy's description of it made every one of us want to go visit the site ourselves.



Robert with an array of 3D printed telescope parts.
Photo © by Dana Downey.

The binoscope design is elegant in itself, 3D printed or no. It's difficult to get focusers to nestle close enough together to allow 2" eyepieces, since people's eyes are only 2.25 - 2.5" apart on average. Robert was able to design "reverse Crayford" focusers whose drawtubes have no framework around them on one side, which allows bringing them close enough together. He also bought special 2" eyepieces that minimize the upper barrel thickness for the same reason.

Robert is coming down the home stretch with his 3D printed binocular scope. Look for it at the Oregon Star Party on the weekend of August 11th, and at a future EAS meeting.

solidify a liquid, and the piece is drawn upward out of the vat as the UV light builds it from the top down. Yet another technique is to use a laser to solidify select spots in a layer of powdered plastic, then another layer of powder is added and parts of that layer are fused to the first, and so on to build up the finished product. Robert uses the first method, with the moving head, and rather than print the objects himself he jobs them out to commercial printers where competitive bidding keeps the price low.

One of the big advantages to 3D printing is that you can test out a design, or even just part of a design, modify its design file as you learn its strengths and weaknesses, and print it again with the modifications. Robert has used this technique to zero in on the final design of his focuser, filter cartridges, and even the 1.25" eyepiece adapter, which has evolved from a simple cylindrical plug to a cutaway fluted martin-glass shape with a friction-fit socket to hold 2" filters.



The focuser and tertiary mirror assembly, all 3D printed.

Thank You Storage Junction

Storage Junction has donated the use of a storage unit for us to hold our loaner telescopes when they're not in use. EAS would like to thank Storage Junction for their generosity and support for our group. Please give them a call if you need a storage space, and tell your friends. Storage Junction is located at 93257 Prairie Road (at the intersection of Hwy 99 and Hwy 36, 3 miles south of Junction City) Phone: 541-998-5177



Dorris Ranch Star Party Report

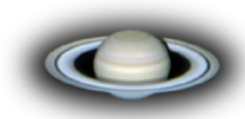
Our Dorris Ranch star party on July 13th went very well. We set up in a clearing in a big grassy field to the east of the ranch buildings, and although there were a lot of loose sticks on the ground it was a nicer site than the tall grass we dealt with the previous year. We were farther from the trees this year, too, so we had a better view to the south.

The star party was well attended. I counted seven telescopes and maybe 30 guests. There were quite a few families with kids ranging from 8-12 or so. The kids were pretty well behaved and interested in what we had to show them. Venus was the early favorite, followed by Jupiter, which cranked up the Wow factor considerably, then Saturn, which cranked it up even further. As the sky grew darker we were able to show off double stars like Albireo, Mizar, and the Double-Double in Lyra.

I got a special request from a woman whose fiancé had bought her a star when he proposed to her many years ago. Could I show her her star? She had a card with the right ascension and the declination figures for it, so we were able to track it down using Sky Safari and star-hop to it in Cassiopeia. It was a 10th-magnitude star next to a distinctive asterism, so it was easy to point out. The woman and her kids were quite pleased to see it.

A lot of astronomers disparage the practice of selling star names since it's not an official designation, but I figure any avenue into developing an interest in astronomy is better than none. Rather than lecture the person about the unofficial nature of their purchase, I simply show them their star and let them enjoy the moment. I often show people their astrological constellation, too, and pick out a few neat objects within that constellation to spark their interest in astronomy for its own sake. So if someone comes up to you at a star party with a similar request, I hope you use the opportunity to increase their enthusiasm rather than shoot them down.

The crowd dissipated around midnight, so we packed up and went home happy with another successful outreach event.



Camp Wilani Star Party Report

The Camp Wilani star party on July 25th went very well. John Loper, Bob Andersen, Andy Edelen, and Jerry Olton brought telescopes, and there were about 30 campers to look through them. The campers came in three groups, youngest first. It was still just twilight when the first group came through, but we had Jupiter, Saturn, the Moon, and Albireo to show them. Later groups got M13, M11, and Mars as well.

The youngest group had the most questions and seemed the most interested in what they were seeing. The oldest group seemed a bit preoccupied with their phones and with conversing among themselves, as I suppose is to be expected of teenagers. They still seemed pretty wowed at the view of Saturn and the Moon and the core of the Andromeda galaxy. (The nearly full Moon precluded seeing more of it than that.)

John says this may have been the last Camp Wilani star party. The camp has been sold, and the future of Camp Wilani and the Camp Fire program is uncertain. I hope they can keep it going. This has always been one of my favorite star parties, both for the site (far enough from town to give us some dark sky) and the kids, who have always seemed a cut above average in terms of interest and knowledge and questions.

Dark-Sky Star Party at Dexter State Park August 4th

Remember our big star party of the summer on Saturday, August 4th at Dexter State Park, about 15 miles southeast of Eugene on Highway 58. In last month's *Io* we included a flyer that you can — and should! — print out and photocopy and post at work and wherever else you can think of that's appropriate. Always ask permission before posting flyers, but do get out there and post them. The farther we spread the word, the more people will come to the party, and the more people who will understand the value of dark sky.

The party will start at dusk, which should be around 9:00. Get there early to set up and learn where everything is. We'll be setting up in the grass to the east of the first parking lot.

To get there, head up Hwy 58 from Goshen. Just as you approach the town of Dexter, you'll see signs for Dexter State Park on the left (north). Park in the first parking lot you come to and set

up in the grass toward the reservoir from there. Note that the closer you set up to the parking lot, the more you risk being in the glare of yard lights across the highway in the town of Dexter.

We'll be giving away two telescopes this year, so interest should be high. We need volunteers to direct parking, run the information table, help put red filter material on flashlights, and so on. We'll coordinate things via the email list, and hopefully between us all we'll anticipate everything we need and have a smooth party.

The main thing is to have lots of club members there with telescopes! Bring yours, and help show people how beautiful the deep, dark sky can be. We have the park all night if we want it, so we can stay and observe on our own after the public has gone home.



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 Jerry Olton, our lending coordinator, to arrange to check out one of these excellent scopes.

Jerry can be reached via email at j.olton@gmail.com or by phone at 541-343-4758.

Mars Star Party Report

On July 29th we held a short-notice Mars observing party at the College Hill Reservoir, figuring we ought to offer people a chance to see Mars while it's at its closest. Unfortunately we didn't plan on the heavy pall of smoke that settled over the valley that night. We were still able to see the major planets through the aerial remnants of northern California, and the smoke gave us a Moon that truly lived up to the "blood moon" moniker, but that was about it.

Still, those of us who showed up with scopes, and the dozen or so guests who came for a look, had a good time visiting and looking at what we could.

Solar SUN-days Off to a Good Start

Dan Beacham's brain child — a regular Sunday solar viewing party — is a howling success. We've had three of them now, and all three were well attended and well appreciated.

Our first, held on July 15th, was the subject of a major article in the Register-Guard a couple of days beforehand and a TV news story on KMTR and KVAL the evening of the star party. The newspaper coverage brought us quite a crowd for our inaugural event, and the TV spot and word of mouth brought almost as many to our July 22nd and 29th parties.



Dan Beacham explains solar features to passers-by

The Sun performed well for us all three times. No sunspots, but we had nice prominences, filaments, and granulation to see. The sky was less favorable on the 15th, filling with high clouds for about an hour, but we had a good half hour to start and a good half hour before we packed up, so that wasn't a disaster. And on the 22nd and 29th it was perfectly clear all afternoon.

On the 22nd and 29th we had a bonus view: Venus by day. The club's trackball telescope was on



Ken Martin and Bob Andersen with Ken and Diane's scope.

hand, and Leticia Montoya was able to spot Venus by eye and aim the scope at it, allowing everyone a look at the planet's half phase. That led to a lot of discussion of solar system dynamics with interested passers-by, who were intrigued to learn that planets showed phases and that you could see them by day.

Bob Andersen performed a neat experiment with the scale model solar system: on the night of the 21st he marked the Moon's diameter on a note card held at arm's length, then on the 22nd he stood at the scale



Kathy Oltion sharing the view.



Some of the many people who attended our solar SUN-day.

model Earth and held the card out toward the scale model Sun. Sure enough, the scale Sun subtended the same angle, just as the real Sun does in the sky.

Solar SUN-days are held every Sunday from noon until 2:00 in Alton Baker Park. We set up near the scale model Sun to the southwest of the duck pond. If you have a solar scope, either H-alpha or white light, bring it! And if not, come enjoy the view with us anyway. We'll keep doing it as long as people keep showing up and the sky cooperates.

Photo Gallery

This has been a good summer for astrophotography. EAS members have gotten out many times under clear skies and taken photos of the Milky way, planets, nebulae both bright and dark, and even some great cloud formations.

Check them out. All photos are scaled to display well at up to 200% magnification, so zoom in.



Mars 7/16/18 Photo © by Jeff Phillips



Milky Way over Eureka Ridge 7/7/18 Photo © by Alan Gillespie



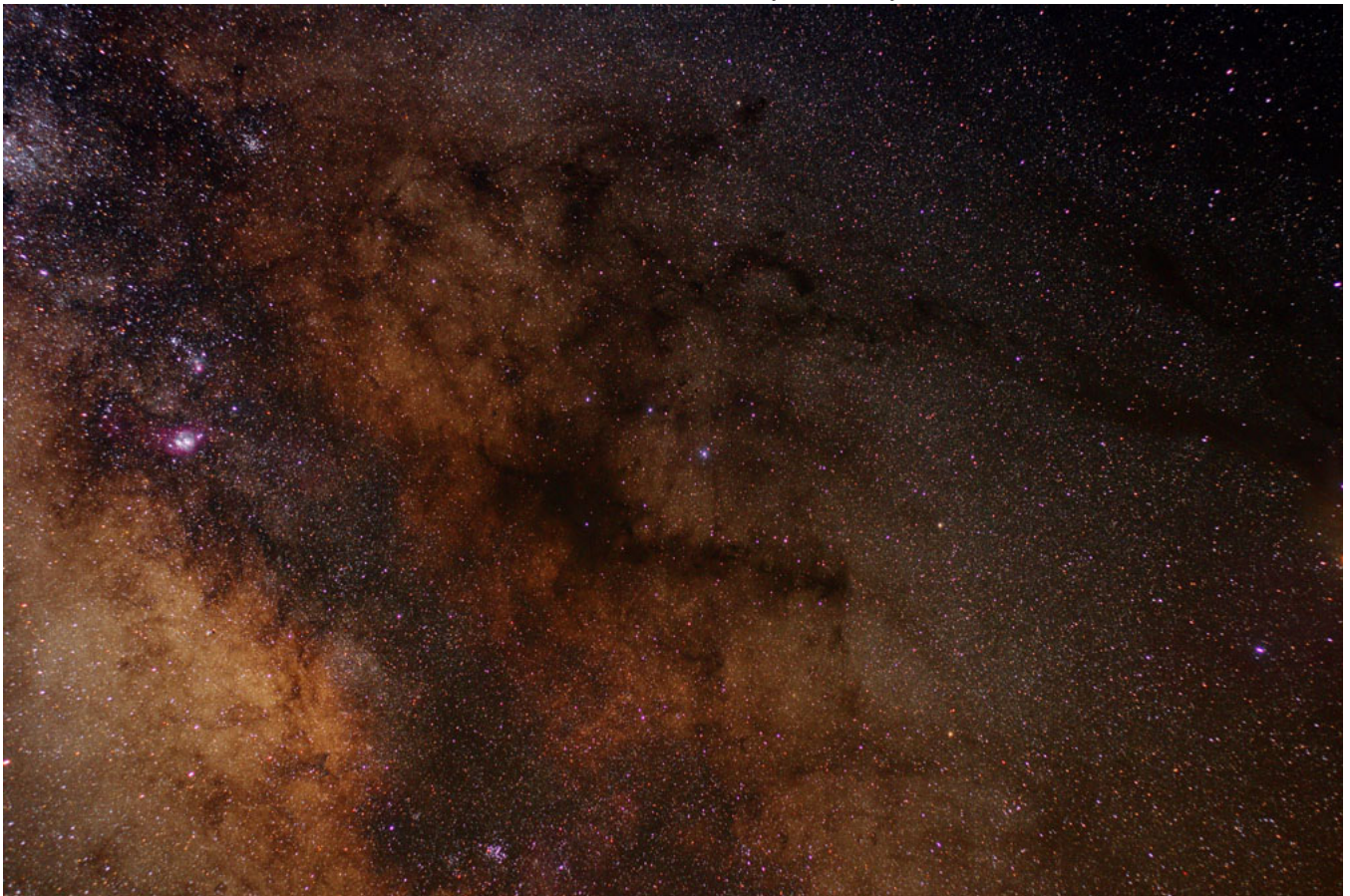
Mars 7/23/18 Photo © by Jeff Phillips



Saturn 7/15/18 Photo © by Jeff Phillips



Eastern Veil Nebula. Photo © by Jim Pelley.



The Dark Horse (turn your head to the left). Photo © by Alan Gillespie.



Hummingbird clouds 7/22/18. Photo © by Bill Murray.



Sunset at Champion Saddle 7/14/18. Photo © by Robert Asumendi.



Saturn in the Milky Way rising above the trees at Eagle's Ridge. Photo © by Bill Murray.

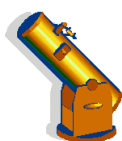


Moon and Mars reflected in lake. Photo © by Alan Gillespie.



Discounted Magazine Subscriptions

One of the benefits of EAS membership is a club discount on subscriptions to *Sky & Telescope* and *Astronomy* magazines. The clubmember rate for *Sky & Telescope* Magazine is \$32.95 for one year or \$65.90 for two years. The clubmember rate for *Astronomy* magazine is \$34 for one year or \$60 for two years. This is the rate for new subscriptions or renewals. New subscriptions have to go through the club secretary (Jerry Oltion) to qualify for the discounted rate, so contact Jerry if you want to start a new subscription. *Sky & Telescope* allows you to renew at the club rate on your own, but *Astronomy* requires renewals to go through the club secretary as well. For more information, contact Jerry at j.oltion@gmail.com or 541-343-4758.



Observing in August



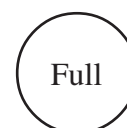
Last Q



New



1st Q



Full

August 4, 11:18 AM	August 11, 2:58 AM	August 18, 00:49 AM	August 26, 4:56 AM
Mercury Lost in Sun	Mercury Lost in Sun	Mercury Rise: 5:16 AM	Mercury Rise: 4:55 AM
Venus Set: 10:15 PM	Venus Set: 9:59 PM	Venus Set: 9:43 PM	Venus Set: 9:22 PM
Mars Set: 4:54 AM	Mars Set: 4:18 AM	Mars Set: 3:45 AM	Mars Set: 3:12 AM
Jupiter Set: 00:12 AM	Jupiter Set: 11:42 PM	Jupiter Set: 11:16 PM	Jupiter Set: 10:47 PM
Saturn Set: 3:04 AM	Saturn Set: 2:35 AM	Saturn Set: 2:06 AM	Saturn Set: 1:34 AM
Uranus Rise: 11:29 PM	Uranus Rise: 11:02 PM	Uranus Rise: 10:34 PM	Uranus Rise: 10:03 PM
Neptune Rise: 9:49 PM	Neptune Rise: 9:21 PM	Neptune Rise: 8:54 PM	Neptune Rise: 8:22 PM
Pluto Set: 4:17 AM	Pluto Set: 3:49 AM	Pluto Set: 3:20 AM	Pluto Set: 2:48 AM

All times Pacific Daylight Time (March 11 - Nov. 3, 2018 = UT -7 hours) or Pacific Standard Time (November 4, 2018 - March 9, 2019 = UT -8 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
8/1/2018	23:16	10:40	03:59	06:01	20:36	22:37
8/2/2018	23:42	11:43	04:01	06:02	20:35	22:35
8/3/2018		12:47	04:03	06:03	20:34	22:33
8/4/2018	00:11	13:53	04:04	06:04	20:32	22:31
8/5/2018	00:43	15:01	04:06	06:05	20:31	22:29
8/6/2018	01:19	16:11	04:08	06:06	20:30	22:27
8/7/2018	02:03	17:19	04:10	06:07	20:28	22:25
8/8/2018	02:56	18:24	04:12	06:08	20:27	22:23
8/9/2018	03:59	19:22	04:14	06:10	20:25	22:21
8/10/2018	05:09	20:12	04:15	06:11	20:24	22:19
8/11/2018	06:25	20:54	04:17	06:12	20:23	22:16
8/12/2018	07:41	21:31	04:19	06:13	20:21	22:14
8/13/2018	08:57	22:03	04:21	06:14	20:20	22:12
8/14/2018	10:09	22:34	04:23	06:15	20:18	22:10
8/15/2018	11:19	23:03	04:24	06:16	20:17	22:08
8/16/2018	12:27	23:33	04:26	06:17	20:15	22:06
8/17/2018	13:32		04:28	06:19	20:13	22:04
8/18/2018	14:34	00:04	04:30	06:20	20:12	22:01
8/19/2018	15:34	00:38	04:31	06:21	20:10	21:59
8/20/2018	16:30	01:16	04:33	06:22	20:09	21:57
8/21/2018	17:21	01:59	04:35	06:23	20:07	21:55
8/22/2018	18:07	02:46	04:36	06:24	20:05	21:53
8/23/2018	18:48	03:38	04:38	06:25	20:04	21:51
8/24/2018	19:25	04:33	04:40	06:27	20:02	21:48
8/25/2018	19:57	05:31	04:41	06:28	20:00	21:46
8/26/2018	20:26	06:31	04:43	06:29	19:59	21:44
8/27/2018	20:54	07:32	04:45	06:30	19:57	21:42
8/28/2018	21:20	08:34	04:46	06:31	19:55	21:40
8/29/2018	21:46	09:36	04:48	06:32	19:53	21:37
8/30/2018	22:14	10:40	04:49	06:33	19:52	21:35
8/31/2018	22:44	11:45	04:51	06:35	19:50	21:33

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

Items of Interest This Month

- 8/1 Red Spot transits 11:40 PM.
- 8/4 **Dexter Dark Sky star party.**
- 8/7 Io shadow transit 8:45 - 10:54 PM. Mag. 8.8 star emerges from behind Jupiter ~10:30 PM.
- 8/11 Red Spot transits 10:00 PM.
- 8/11-13 Perseid meteor shower (peaks on morning of 13th, but good for several nights before and after).
- 8/13-16 Jupiter within 1/2° of Zubenelgenubi.
- 8/14 Multiple moon shadow transit (Io & Ganymede) 10:39-11:37 PM
- 8/16 Red Spot transits 9:09 PM. Io and Europa very close together all night.
- 8/17 **First Quarter Friday star party.** Venus at greatest eastern elongation (46°).
- 8/18 Red Spot transits 10:48 PM. Europa and Ganymede close together all night.
- 8/23 Shadow transits early, Red Spot 10:00.
- 8/26 Mercury at greatest eastern elongation (18°). Visible in morning before sunrise.
- 8/30 Multiple shadow transit (Io & Europa) 10:12 - 11:07 PM.
- 8/31-9/1 Venus 1° from Spica. Good chance to see a planet and a star by day.