

Eugene Astronomical Society



www.eugeneastro.org

IO - September 2018

Eugene Astronomical Society
 Annual Club Dues \$25
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EAS is a proud member of
 The Astronomical League



Next Meeting Thursday, September 20th, 7:00 p.m. A Demonstration of the New Planetarium Projector by Haley Sharp

The planetarium at the Eugene Science Center was upgraded in early August with a brand new, state-of-the-art, 4K projection system. Join planetarium director Haley Sharp to see what this new system is capable of. Highlights include:

- constellation lines and artwork from many different cultures
- proper motion of stars, showing how the positions of the stars have changed and will continue to change over millennia

- high resolution surface maps of Earth, the moon, Mars, and Mercury
- ability to view 3D models of irregular bodies such as asteroids or spacecraft

...and much more! Haley will walk you through many of these new features during her presentation. Her hope is that club members will be inspired to take advantage of their unique meeting space for future EAS presentations.



Illustration credit: Rob Spearman.

Next First Quarter Friday: September 14th

Our August 17th star party was a great success. We had about a dozen telescopes and 40-50 people to look through them. The sky cooperated, with the smoke clearing for the night and the seeing steadying out well enough for us to pick out the Cassini Division in Saturn's rings and to split the double-double in Lyra.

A notable telescope made its debut that night: Robert Asumendi brought his recently completed 8" binocular scope, which wowed everyone who looked through it. This is the scope that Robert discussed at our July meeting, telling us how he 3D printed most of the upper end. Congratulations, Robert, on finishing the scope and doing such a fabulous job on it! (See more about this scope on p.3.)

Our next First Quarter Friday will be September 14th. 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 7:45 in September.)

September 14 (32% lit)

October 12 (17% lit)

November 9 (6% lit)

December 14 (46% lit)

August 16th Meeting Report

Water, Water, Everywhere!

by Al LePage

At our August 16th meeting, Al LePage gave a fascinating talk on the origins of water in the universe and the state of water in our solar system today. He started out with the Big Bang, which produced a lot of hydrogen and helium, but not much else. Water is hydrogen oxide, so for water to form, the universe had to wait for stars to condense out of the primordial cloud and fuse the hydrogen and helium into heavier elements, including oxygen, then explode in supernovae and spread that oxygen out into space. That happened relatively quickly, and is still an ongoing process, so water has become ubiquitous in the cosmos.

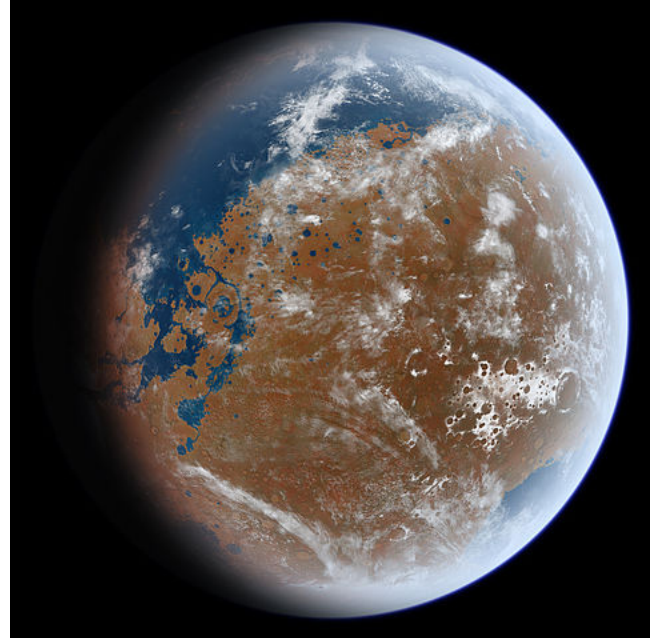
Our solar system formed from a cloud of gas and dust that was rich with water, but geologists were faced with a conundrum: the impacts that formed the inner planets should have cooked any water out of the planets, leaving them high and dry. Water clearly had to have arrived later, probably in comet impacts as comets brought water (in the form of ice) inward from colder regions farther from the Sun.

Alas, that theory ran afoul of on-site measurements when we started sending probes to comets and found that comets had different isotope ratios than Earthly water. Many asteroids, however, have isotope ratios similar to Earth, which leads to the conclusion that water arrived here in asteroid impacts, quite possibly in the very early impacts that formed the Earth in the first place. It turns out water can bind

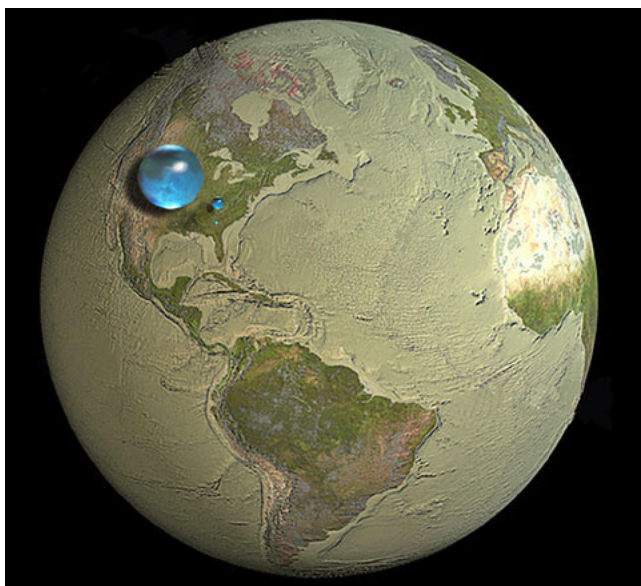
chemically to rocks much more robustly than we previously thought, possibly well enough to survive the baking of early accretion. That would explain Mars's early oceans, too, which recent probes have confirmed the existence of.

Al went on to illustrate how little water actually exists on Earth. You might think that with 70% of our world covered by oceans, water makes up the bulk of the planet, but that's not even close. If all the water on Earth were gathered into a ball, that ball would only be a few hundred miles across, spanning less than half the United States. All the *fresh* water would be that smaller blue dot to the right of it, while all the *available* fresh water is that tiny speck below the small dot.

So even though the universe is quite literally awash in water, it's still not as plentiful as we might think. Al left us with much to think about. Thanks, Al!



Mars in its early years when it still had oceans.
Artwork courtesy Ittiz/Wikimedia Commons.



All the water on (and in) Earth gathered into one ball.
Artwork courtesy USGS.

Two New and Innovative Telescopes

The Oregon Star Party often serves as a motivator for people to finish up their telescope projects so they can use them under central Oregon's pristine skies and show them off at the Telescope Walkabout. This year the OSP deadline spurred two EAS members into finishing two wild new telescope designs.



Photo © by Mark Thorson

Also just in time for OSP, Robert Asumendi finished his 8" binocular scope. This is the scope he talked about at our July meeting, for which he 3D printed most of the upper-end parts. The focusers, secondary supports, tertiary supports, filter housings, strut mounts, and various other parts were all designed on his computer, then 3D printed with carbon-fiber infused material, resulting in a rigid yet lightweight structure that makes this one of the most solid binocular scope designs yet made, while being portable enough to set up and observe with in just a few minutes. For a binocular scope, that's incredible.

Both of these scopes represent major breakthroughs in telescope design, and they were made right here by EAS members. Congratulations, guys!

Mel Bartels finished his 25" f/2.6 (not a typo!) widest-field telescope, and he added a new twist to the mount design: an extra altitude axis perpendicular to the usual one. The extra axis of motion completely eliminates the common "Dob's hole" problem common to Dobsonian alt-az mounts.

Mel's scope also features a new design of helical Crayford focuser made by Pierre LeMay of Canada. The focuser has two speeds of motion, which is a brand new feature in helical Crayfords.

Mel's scope only weighs 75 pounds, and the eyepiece height is just 5 feet at the zenith, which means it requires no ladder. It's an amazing advance in thin, fast mirrors and in telescope design as well.



Photo © by Mark Thorson



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



Photo © by Jerry Olton

Dexter Dark-Sky Star Party Report

Our annual dark sky star party at Dexter State Park was held on Saturday, August 4th, under clear skies and mild temperatures. Turnout was much greater than in previous years, with about 20 telescopes on the field and 150-200 people gathered to look through them. The Sun set at 8:32, and we were up and running by 8:45-9:00 and we didn't slow down until about midnight.

We gave away two telescopes this year, and interest was high. We had 52 kids at the drawing, 24 in the 8-12 age range and 28 in the 13-18 age range. Both scopes went to enthusiastic kids at the low end of their age range. The 4.5" Starblast went to Rachel Roe of Springfield, age 8 going on 9, and the 6" Dob went to Joel Hahn, 13, of Eugene.

Al LePage donated two books: David Levy's *Skywatching* and Terence Dickinson's *Nightwatch*. Those were given out after the telescopes, also to enthusiastic youngsters. Emily Ausborn, 9, of Bethel, got *Nightwatch*, and a boy of unknown name or age got *Skywatching* and immediately ran off to tell his friends.

Steve Frankel mentored one of the telescope winners. The other winner's father was already into astronomy, so she didn't need a mentor other than her dad. Both kids were given complimentary one-year memberships to the club.

Nikki Frank, Janet Whitesides, and Shade Rose ran the welcome table and they were swamped from the opening bell to the end of the night. So were the telescope operators, who had long lines at their scopes all night long. Randy and Annette with their new (to them) 18" Starmaster that they recently purchased from Jim Jackson were especially mobbed, with the line from their scope at the lower end of the field often stretching nearly to the welcome table at the top of the field.

Few of us were able to show people more than half a dozen objects, since the lines never ended. In future years, we may want to explore the idea of having separate lists of objects to look at so we're not duplicating the views in different scopes. Nobody complained, though. Everyone seemed happy with the array of planets and clusters and nebulae we showed them.

One new development seemed disturbingly obvious to several of us: the Eugene/Springfield light



Photo © by Jerry Olton

The winners of our telescope and book giveaway, Rachel Roe, Emily Ausborn, and Joel Hahn



dome was significantly brighter and extended higher than in previous years. M51, usually a staple at this star party, was washed out even in Jerry's 20" scope. Nothing to the west of the zenith looked as good as in previous years. Undoubtedly this is the result of more lighting in the metropolitan area and increased use of full-spectrum LED lighting, which scatters more readily since it's much bluer than sodium vapor lighting.

The lights from Dexter weren't a problem this year. The one really bad yard light was turned off, and the others were hidden behind vegetation that has grown up in recent years. So not all the changes regarding lighting were for the worse.

Many thanks to everyone who brought a telescope, helped with logistics, ran the welcome booth, ran the giveaway, or just came to be part of the party. It was a great tenth anniversary star party. Let's do it again next year!



The star party in progress. Photo © by Alan Gillespie

Photos

August was another good month for astrophotography. The Perseids didn't put on much of a visual show, but Dave Horton caught several on camera from high in the Cascade Range. Jim Pelley got a good shot of the Draco triplet, Jeff Phillips got several good shots of Mars and Saturn, Alan Gillespie got a great shot of the thin crescent Moon, and Mel Bartels made two beautiful sketches of the view through his new 25" scope.

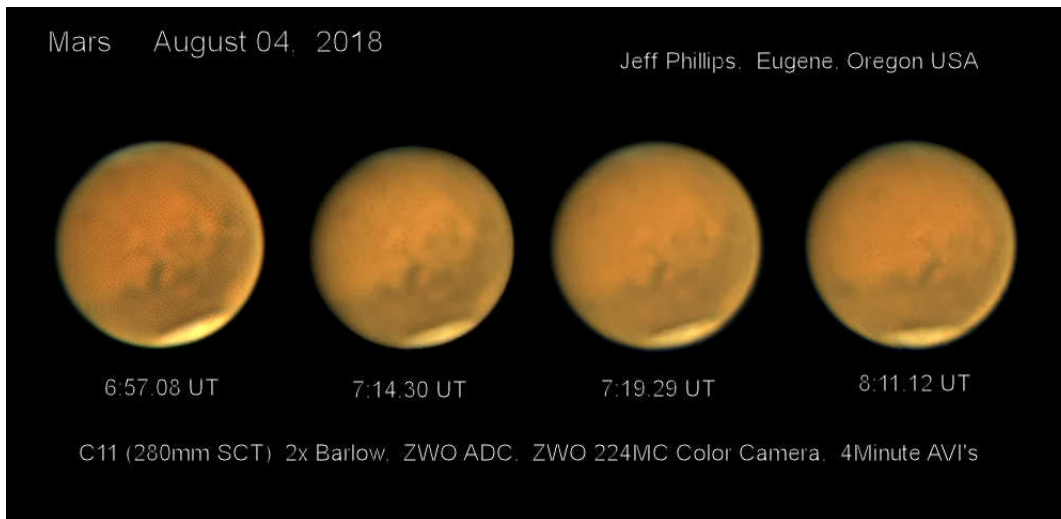
Check them out. All images are scaled to display well at up to 200% magnification, so zoom in.



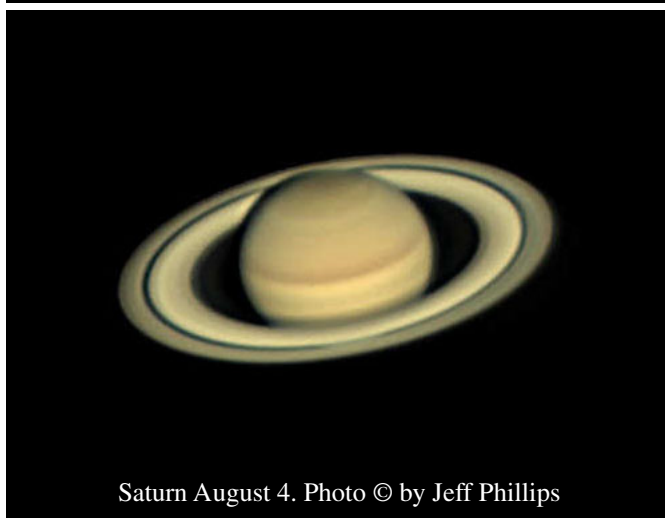
Perseid meteor shower with sporadics from near McKenzie Pass. Photo © by Dave Horton



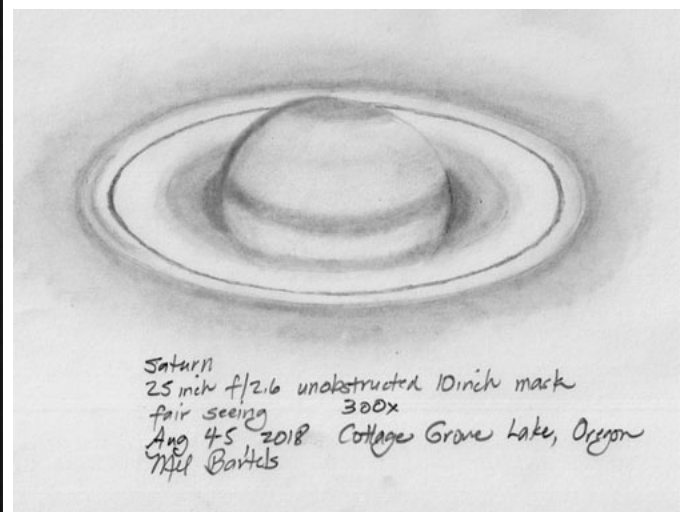
The Draco Triplet. Photo © by James Pelley

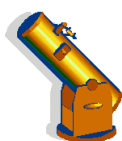


Jeff Phillips took this series of images of Mars on August 4th between 11:57 and 1:11 local time, showing how far Mars rotates in just over an hour. There was a dust storm covering most of the planet, but stacking images helped bring out detail despite the reduced contrast.



Mel Bartels took his new 25" f/2.6 scope out for first light on the night of August 4th and sketched what he saw: M51 with Interplanetary Flux Nebula surrounding it, and Saturn as seen through the scope when masked down to 10" (f/6.5).





Observing in September



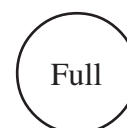
Last Q



New



1st Q



Full

Sept 2, 7:37 PM	Sept 9, 11:01 AM	Sept 16, 4:15 PM	Sept 24, 7:52 PM
Mercury Rise: 5:11 AM	Mercury Rise: 5:47 AM	Mercury lost in Sun	Mercury lost in Sun
Venus Set: 9:04 PM	Venus Set: 8:43 PM	Venus Set: 8:21 PM	Venus Set: 7:54 PM
Mars Set: 2:48 AM	Mars Set: 2:26 AM	Mars Set: 2:09 AM	Mars Set: 1:52 AM
Jupiter Set: 10:22 PM	Jupiter Set: 9:57 PM	Jupiter Set: 9:33 PM	Jupiter Set: 9:05 PM
Saturn Set: 1:06 AM	Saturn Set: 00:38 AM	Saturn Set: 00:11 AM	Saturn Set: 11:37 PM
Uranus Rise: 9:35 PM	Uranus Rise: 9:07 PM	Uranus Rise: 8:39 PM	Uranus Rise: 8:07 PM
Neptune Rise: 7:54 PM	Neptune Set: 6:41 AM	Neptune Set: 6:13 AM	Neptune Set: 5:40 AM
Pluto Set: 2:20 AM	Pluto Set: 1:52 AM	Pluto Set: 1:24 AM	Pluto Set: 00:53 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
9/1/2018	23:18	12:51	04:52	06:36	19:48	21:31
9/2/2018	23:58	13:58	04:54	06:37	19:46	21:29
9/3/2018		15:05	04:55	06:38	19:44	21:27
9/4/2018	00:46	16:10	04:57	06:39	19:43	21:24
9/5/2018	01:42	17:08	04:58	06:40	19:41	21:22
9/6/2018	02:47	18:01	05:00	06:41	19:39	21:20
9/7/2018	03:59	18:45	05:01	06:43	19:37	21:18
9/8/2018	05:14	19:24	05:03	06:44	19:35	21:16
9/9/2018	06:30	19:59	05:04	06:45	19:34	21:14
9/10/2018	07:45	20:30	05:06	06:46	19:32	21:12
9/11/2018	08:58	21:00	05:07	06:47	19:30	21:09
9/12/2018	10:08	21:30	05:09	06:48	19:28	21:07
9/13/2018	11:16	22:02	05:10	06:49	19:26	21:05
9/14/2018	12:22	22:36	05:11	06:51	19:24	21:03
9/15/2018	13:24	23:13	05:13	06:52	19:23	21:01
9/16/2018	14:22	23:54	05:14	06:53	19:21	20:59
9/17/2018	15:16		05:16	06:54	19:19	20:57
9/18/2018	16:04	00:40	05:17	06:55	19:17	20:55
9/19/2018	16:47	01:31	05:18	06:56	19:15	20:53
9/20/2018	17:25	02:25	05:20	06:57	19:13	20:51
9/21/2018	17:59	03:22	05:21	06:59	19:11	20:49
9/22/2018	18:29	04:22	05:22	07:00	19:10	20:47
9/23/2018	18:57	05:23	05:24	07:01	19:08	20:45
9/24/2018	19:23	06:25	05:25	07:02	19:06	20:43
9/25/2018	19:50	07:28	05:26	07:03	19:04	20:41
9/26/2018	20:17	08:32	05:28	07:04	19:02	20:39
9/27/2018	20:46	09:37	05:29	07:06	19:00	20:37
9/28/2018	21:19	10:44	05:30	07:07	18:58	20:35
9/29/2018	21:57	11:52	05:31	07:08	18:57	20:33
9/30/2018	22:41	12:59	05:33	07:09	18:55	20:31

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

Items of Interest This Month

Venus goes from 40% to 17% lit this month.
 Zodiacal light visible before dawn this month.
 Good month for Neptune and Uranus.
 Good month for Vesta in Sagittarius (passing several interesting objects throughout the month).
 9/1 Venus and Spica just over 1° apart.
 9/2 Red spot centered 8:18 PM.
 9/3 Europa and Io pass one another just before sunset, pulling apart thereafter.
 9/5-6 Mercury 1.5° above Regulus before dawn.
 9/7 Neptune at opposition. Comet 21P Giacobini-Zinner near M36 & M38, Jupiter's Red Spot centered at sunset.
 9/9 Comet 21P G-Z near M37.
 9/14 **First Quarter Friday star party.** Comet 21P G-Z in M35! (Rises after midnight, early on 15th).
 9/21 Venus at its brightest (Mag -4.8).
 9/22 Autumnal Equinox 6:54 PM.
 9/29 Waning gibbous Moon rises 1/2° above Aldebaran at 10:00 PM, pulls away in following hours.

Dues are Due! It's time to renew your membership. \$25 at our September meeting.