



IO - July 2019

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



Next Meeting Thursday, July 18th, 7:00 p.m.

A Time of Great Courage: The Apollo 11 Mission

by Bernard W. Bopp

Professor of Astronomy, Emeritus

When John F. Kennedy became President of the United States in January 1961, Americans believed that the United States was losing the Space Race with the Soviet Union, which had successfully launched the first artificial satellite, Sputnik 1, almost four years earlier. On April 12, 1961, Russian cosmonaut Yuri Gagarin became the first man to orbit the Earth, a feat the U.S. would not duplicate until nearly a year later. In September 1962, Kennedy boldly set a goal for the U.S. of landing a man on the moon "...in this decade."

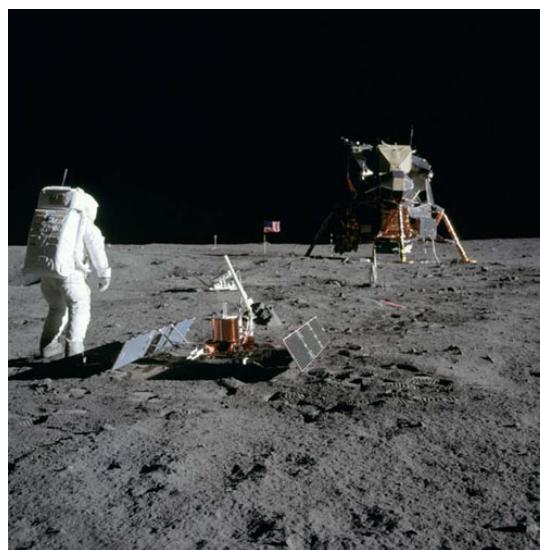
It was July 1969, and that goal was ready to be achieved. Three astronauts, Mike Collins, Buzz Aldrin, and Neil Armstrong were ready to pilot the Apollo 11 spacecraft to the moon and back. The mission had important scientific goals: it aimed to determine the age of the lunar rocks, to examine particles emitted by the Sun (the "solar wind"), to probe the moon's internal structure, and to precisely determine the moon's distance and orbit. This last experiment, the "Lunar Ranging RetroReflector (LR3)" was a project that I had the privilege of working on as a 22-year-old graduate student.

But this first lunar landing was a high-risk mission, with many possible ways to fail. There was the very real possibility of crashing onto the lunar surface or damaging the lander so it could not return to the main spacecraft. In both scenarios, the two astronauts in the lander would be killed. Before the launch, astronaut Mike Collins estimated the odds of a completely successful mission as "...one chance in three."

On July 20, 1969 at 17:44 Greenwich time, Buzz Aldrin and Neil Armstrong undocked *Eagle*, the lunar landing craft from *Columbia*, the command module, to begin the descent to the lunar surface.

It was a time of great courage.

Club meetings are held at the Eugene Science Center planetarium, 2300 Leo Harris Parkway in Eugene (behind Autzen Stadium). Meetings start at 7:00 sharp. Come early to visit and get a seat.



Buzz Aldrin with the Passive Seismic Experiment Package in the foreground and the Laser Ranging RetroReflector in the background.

June 20th Meeting Report

At our June 20th meeting, Larry Deckman gave a beautiful and informative presentation on the Sun and the seasons. Using photographs of Eugene's foliage at the solstices and equinoxes as starting points, he pointed out the effects of the seasons on our daily lives, and by showing the difference in the amount of daylight versus darkness in various cities of the world he showed how (and why) the seasonal variations become more extreme with increased latitude. That in turn affects global population: not surprisingly, more people live at latitudes that have mild seasonal changes than at latitudes with wild swings in temperature and light.

Larry's talks always center around beautiful imagery and this one was no exception. We were once again treated to some fabulous photos of various parts of the world at various times of the year, along with Larry's easily understood explanation of how the tilt of the Earth's axis affects practically everything we do. It was a great program. Thanks, Larry!

Next First Quarter Friday: July 12th

Our June 7th star party was clouded out, but our Saturday backup went well. We had half a dozen telescopes and maybe three times that many guests to look through them.

Our next star party will be July 12th. 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 the year. Star parties start at dusk or 6:00, whichever is later. (9:00 in July.)

July 12 (86% lit)
October 4 (44% lit)

August 9, (75% lit)
November 1 (28% lit)

September 6 (61% lit)
December 6 (76% lit)

Dark Sky Star Party July 27th

Our 11th annual Dark Sky Star Party is scheduled for Saturday, July 27th at Dexter State Park, 15 miles southeast of Eugene on Highway 58, just opposite the town of Dexter and at the west end of Dexter Reservoir. This is our big blowout star party of the year, the one where we give away two telescopes to kids between the ages of 8 and 18, and we show well over 100 people what you can see through a telescope under a truly dark sky. This is by far the most popular star party of the year. Mark your calendar and make sure you're there!

We'll need volunteers to run the welcome table, help with the telescope giveaway, and teach the telescope winners how to use their new scopes, plus we'll need plenty of people with their own telescopes to show the sights to the big crowd. We can coordinate all that on our email list as the time approaches.

Robert Asumendi has made a beautiful poster for the event, which we reproduce on the next page. Print it out and post it at work and anywhere else you can think of that's appropriate. Download the file at <https://www.dropbox.com/s/2d66xscmzke1f6c/dexter-star-party-flyer-letter-color-0001.pdf?dl=0> and email it to friends. Let's really get the word out this year!



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

EUGENE ASTRONOMICAL SOCIETY PRESENTS

Dark Sky

DEXTER

Star Party

JULY 27 @ 9:00

DEXTER STATE PARK

VIEW

GALAXIES,
NEBULAE,
PLANETS, AND MORE

THROUGH DOZENS OF TELESCOPES

TELESCOPE GIVEAWAY

(kids between the ages of 8-18)

This year, we're giving away two telescopes:
a 4.5" Orion Starblast and a 6" Orion
Skyquest Dobsonian. Both are brand new
telescopes with extra eyepieces
to make complete observing packages.



Come see the wonders of the night sky far from city lights

ABSOLUTELY FREE!

Sponsored by Oregon State Parks and the Eugene Astronomical Society
check EugeneAstro.org for details and weather updates



Photo © by Amy Baker

Solar SUN-days Heat Up!

With the onset of spring and summer weather, our weekly Solar SUN-day solar viewing party has once again become a popular event. The *Register-Guard* did a story on it in early June, and two different TV stations did stories on it in the following weeks. That has led to fairly substantial crowds each Sunday.

We meet every Sunday from noon to 2:00 at Alton Baker Park. We gather next to the scale model Sun on the west side of the duck pond, which seems like a natural spot for people to come look at the Sun. And even though we're at the minimum point in the 11-year solar cycle, we generally have at least a few prominences and filaments to show people.

People walking by often ask what we're up to, and express surprise that it's possible to look at the Sun safely through a telescope. We're quick to point out that it takes special equipment, but we have that equipment and are happy to share it.



Photo © by Amy Baker

Bob Andersen, Alan Reinoehl, and Jerry Olton discuss the Sun with passers-by.



Photo © by Amy Baker

Dan Beacham shows guests the view through his solar telescope.

We're quick to point out that it takes special equipment, but we have that equipment and are happy to share it.

People are full of questions about the Sun, which we do our best to answer. We have developed an information sheet with "fun Sun facts" for people to take home with them.

Jerry Olton also has a display of sundials, including a tiny sundial on a business card that people can take home as well. Telling time by the Sun is proving to be just as interesting a subject as the view through our solar telescopes.

Jerry and Mike Smith are also making an analemma, which is the figure-8 that you get if you mark the shadow of a pole at exactly the same clock time

every week. They're doing theirs at 1:00, which because of daylight savings time makes an analemma that points directly north-south. (It's actually 3° off, since Eugene is 12 minutes into the Pacific time zone and they didn't think to correct for that until they'd already begun marking points.) Each Sunday, and some days inbetween, they mark the spot where the shadow of a 10-foot pole lands at 1:00. They started last November and subsequent marks made the wide



Jerry Olton points to the summer solstice mark.
Photo © by Dana Downie.



Jerry Olton explains how sundials work.

end of the analemma near the winter solstice, and just last week they turned the corner on the summer end. It'll be several more months before they connect with last year's marks, and probably another year or two to fill in the often-cloudy winter months. When they get it finished, they plan to make it permanent with brass pegs drilled into the concrete.

Come join the fun! We're there in Alton Baker Park every clear Sunday from noon to 2:00.



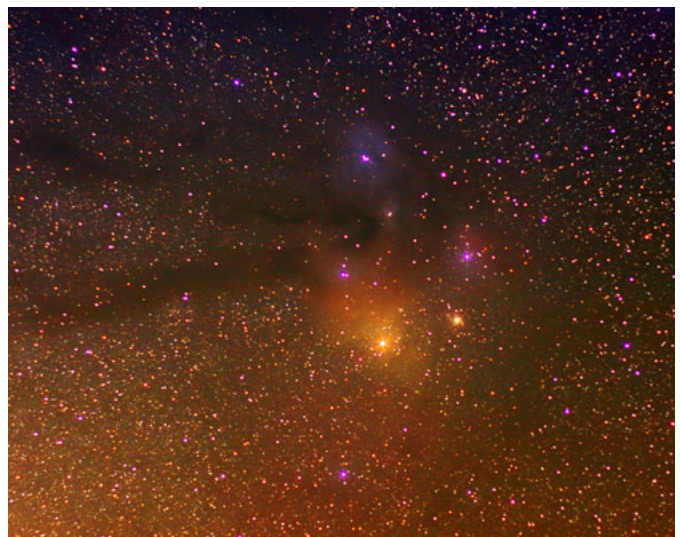
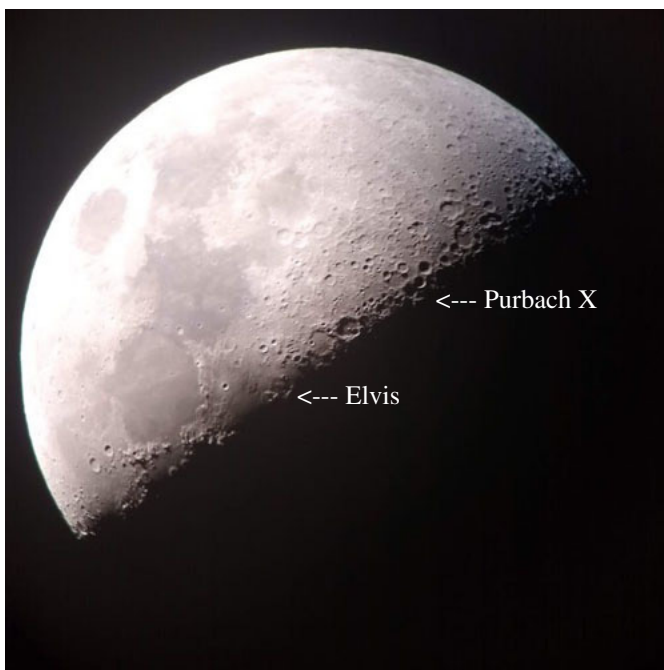
The analemma under way. There were a lot of cloudy days between December and May.

Gallery

June was a great month for astrophotos! Amy Baker, Alan Gillespie, Jim Pelley, Karmin Peterson, and Frank Szczepanski all got some nice images. Zoom in a bit and enjoy!



Jupiter and the Milky Way from Eureka Ridge, with Roseberg skyglow in the distance. Photo © by Amy Baker.



The Rho Ophiuchi complex. Photo © by Alan Gillespie

< The first quarter Moon with the Purbach X and Elvis visible. Photo © by Frank Szczepanski.



^ The Milky Way from Eagle's Ridge. Note the dark horse on the right. Photo © by Alan Gillespie



Noctilucent clouds on June 9th. Photo © by Karmin Peterson.







Observing in July

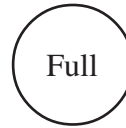


New

1st Q



Full



Last Q



July 2, 12:16 PM*	July 9, 3:55 AM	July 15, 2:38 PM	July 24, 6:18 PM
Mercury Set: 10:07 PM	Mercury Set: 9:33 PM	Mercury lost in Sun	Mercury lost in Sun
Venus Rise: 4:43 AM	Venus Rise: 4:52 AM	Venus Rise: 5:03 AM	Venus Rise: 5:21 AM
Mars Set: 10:13 PM	Mars Set: 9:59 PM	Mars Set: 9:47 PM	Mars Set: 9:27 PM
Jupiter Set: 4:05 AM	Jupiter Set: 3:35 AM	Jupiter Set: 3:09 AM	Jupiter Set: 2:31 AM
Saturn Rise: 9:13 PM	Saturn Set: 5:50 AM	Saturn Set: 5:24 AM	Saturn Set: 4:46 AM
Uranus Rise: 1:52 AM	Uranus Rise: 1:25 AM	Uranus Rise: 1:02 AM	Uranus Rise: 00:27 AM
Neptune Rise: 00:10 AM	Neptune Rise: 11:39 PM	Neptune Rise: 11:15 PM	Neptune Rise: 10:39 PM
Pluto Rise: 9:33 PM	Pluto Rise: 9:05 PM	Pluto Set: 5:46 AM	Pluto Set: 5:10 AM

All times Pacific Daylight Time (March 10 - Nov. 2, 2019 = UT -7 hours) or Pacific Standard Time (November 3, 2019 - March 8, 2020 = UT -8 hours)

Date	Moon Rise	Moon Set	Twilight Begin	Sun Rise	Sun Set	Twilight End
7/1/2019	04:35	20:08	03:09	05:33	20:59	23:22
7/2/2019	05:27	21:11	03:10	05:34	20:59	23:22
7/3/2019	06:30	22:06	03:12	05:34	20:59	23:21
7/4/2019	07:40	22:53	03:13	05:35	20:58	23:20
7/5/2019	08:55	23:32	03:14	05:36	20:58	23:19
7/6/2019	10:10		03:15	05:36	20:58	23:18
7/7/2019	11:26	00:06	03:16	05:37	20:57	23:17
7/8/2019	12:39	00:36	03:18	05:38	20:57	23:16
7/9/2019	13:50	01:04	03:19	05:38	20:57	23:15
7/10/2019	15:01	01:32	03:20	05:39	20:56	23:14
7/11/2019	16:10	02:01	03:22	05:40	20:56	23:13
7/12/2019	17:17	02:32	03:23	05:41	20:55	23:12
7/13/2019	18:22	03:08	03:25	05:42	20:54	23:10
7/14/2019	19:22	03:48	03:27	05:42	20:54	23:09
7/15/2019	20:16	04:35	03:28	05:43	20:53	23:07
7/16/2019	21:02	05:27	03:30	05:44	20:52	23:06
7/17/2019	21:42	06:23	03:31	05:45	20:52	23:04
7/18/2019	22:16	07:22	03:33	05:46	20:51	23:03
7/19/2019	22:46	08:22	03:35	05:47	20:50	23:01
7/20/2019	23:12	09:23	03:37	05:48	20:49	23:00
7/21/2019	23:36	10:23	03:38	05:49	20:48	22:58
7/22/2019	23:59	11:23	03:40	05:50	20:47	22:56
7/23/2019		12:23	03:42	05:51	20:46	22:54
7/24/2019	00:22	13:24	03:44	05:52	20:45	22:53
7/25/2019	00:47	14:27	03:46	05:53	20:44	22:51
7/26/2019	01:15	15:33	03:47	05:54	20:43	22:49
7/27/2019	01:47	16:40	03:49	05:55	20:42	22:47
7/28/2019	02:25	17:47	03:51	05:56	20:41	22:45
7/29/2019	03:12	18:52	03:53	05:57	20:40	22:43
7/30/2019	04:09	19:51	03:55	05:58	20:39	22:41
7/31/2019	05:16	20:43	03:57	05:59	20:38	22:40

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

Items of Interest This Month

- 7/2 Total solar eclipse (visible only from southern hemisphere).
- 7/3 Jupiter's red spot transits 10:22 PM.
- 7/5 Jupiter's moons cluster together ~10:00. Red spot transits at midnight.
- 7/9 Saturn at opposition. Look for Seeliger effect (rings brighter than usual).
- 7/10 Red spot transits 11:08 PM.
- 7/11 Io shadow transit 9:31 – 11:43 PM.
- 7/12 First Quarter Friday star party.** Red spot transits 00:37 7/13 AM.
- 7/15 Red spot transits 10:16 PM. Almost-full Moon passes within 1° of Saturn ~midnight.
- 7/16 Full Moon cruises past M75 ~midnight – 1:30 AM 7/17.
- 7/17 Red spot transits 11:55 PM.
- 7/18 Io shadow transit 11:26 PM – 1:38 AM.
- 7/22 Callisto passes under Jupiter's S. pole. Red spot transits 11:03 PM.
- 7/23 Europa shadow transit 8:44 – 11:15 PM.
- 7/24 Ganymede shadow transit 8:26 – 10:53 PM
- 7/27 Dexter Dark Sky Star Party.** Io shadow transit ends 10:02. Red spot transits 10:12.
- 7/29 Red spot transits 11:50 PM
- 7/30 Europa shadow transit 11:21 PM – 1:51 AM.

*7/31 2nd New Moon of month 8:12 PM .