

skylights

Newsletter of the Astronomical Society of Northern New England



APR 2018



Member of NASA's



Astronomical League

ASNNE MISSION

ASNNE is an incorporated, non-profit, scientific and educational organization with three primary goals:

1) To have fun sharing our knowledge and interest with others.

2) To provide basic education in astronomy and related sciences to all who are interested.

3) To promote the science of Astronomy.

What's Up in April

By Bernie Reim

The month of April is named after aprilis, which means aperture or opening. That is what this part of the northern hemisphere will be doing as it warms up consistently and a hint of green will return towards the end of this first full month of spring.

There will be plenty of interesting highlights this month as we open ourselves to what the spring skies have to offer us. There will be a very close conjunction of Saturn and Mars in the morning sky and then a nice conjunction of the slender waxing crescent moon with Venus and the Pleiades in Taurus by the middle of April. To top it off, the first good meteor shower since the Geminids last year will happen on Sunday night the 22nd, which is also Earth Day. They are called the Lyrids and they are caused by Comet Thatcher.

Mars has been approaching Saturn fairly rapidly each morning towards the end of March. The red planet will finally appear to catch and then overtake the ringed planet on the second day of this month in Sagittarius and then continue eastward into the next constellation, Capricorn. They will be just over one degree apart when that happens. Then keep watching as a last quarter moon joins the pair on April 7. The best time to see this would be about an hour before sunrise as dawn begins to break over the ocean.

I was able to see the nice morning line up of 3 bright planets and 3 bright stars along with a waning crescent moon about an hour before sunrise last month. The earth shine reflected back to us from the moon added a nice three dimensional sense of depth to this lovely string of celestial pearls suspended over the Atlantic as dawn was breaking. A similar sequence will occur again in the morning sky this month, but Mars and Saturn will have switched places from our perspective in their constant motions around the sun.

Then continue along this string and you will encounter Antares, an orange supergiant star in

Scorpius that is 700 times the size of our own sun. Its very name means "rival of Mars" and it is about the same brightness and color as Mars is now. If you could place Antares where our sun is in the sky, its outer surface would engulf our solar system out to beyond the orbit of Mars around our sun.

Jupiter begins the month rising 3 hours after sunset, but ends the month rising just half an hour after sunset. The king of the planets continues to get a little brighter and closer and bigger each evening and is getting very close to its best for the year. That is called opposition and will happen in early May. Notice that Jupiter is already tracing its retrograde or westward loop in our sky in Libra now. That westward motion will not end until two months after its opposition.

Mercury has left Venus in the evening sky and switched back to the morning for most of this month. However, it will be a low appearance for our first planet as it only rises about an hour before sunrise and never escapes the twilight low on the eastern horizon. Mercury is now moving from inferior conjunction

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What's Up "Continued from page I"

with the sun to greatest western elongation at 27 degrees west of the sun by the end of the month. Through a telescope, you can watch it get more illuminated even as it gets smaller in our sky.

Venus continues to get higher and set later in our evening sky as the month progresses. Our sister planet will not reach its highest point for this appearance until June, when it will not set until 10 pm. Notice that a slender waxing crescent moon will join Venus in the evening sky on April 17 and then continue into Taurus past the Pleiades and the bright orange giant star named Aldebaran in the Hyades star cluster, which marks the face of Taurus the bull.

The Lyrid meteor shower peaks on Sunday morning the 22nd, which is also Earth Day. If you wait until the last quarter moon sets around midnight on the 21st, you could see about 10 to 15 meteors per hour. That is not a great rate, but it is better than the background rate of 3 or 4 per hour on any clear night of the year without a particular shower taking place.

All of the Lyrids will appear to emanate from the constellation of Lyra the Harp, close to its border with Hercules. Caused by Comet Thatcher, this is the oldest recorded meteor shower. It was first recorded 2700 years ago in China. The Lyrids are caused by tiny, sand grain-sized pieces of this comet entering our upper atmosphere at about 70 miles high at around 35 miles per second. They are the second fastest meteors after the Leonid Shower in November. There is an outburst of nearly 100 meteors per hour about every 30 years, but one is not expected this year. Its parent comet has a long orbit around the sun of 415 years and its last close pass was in 1861.

April 1. On this day in 1997 Comet Hale-Bopp made its closest approach to the sun, which is also called perihelion. This was a great comet that hung around for almost a year and covered nearly a quarter of the sky when it was at its best. The year before, another once-in-a-lifetime comet made a close approach to Earth. That one was called Comet Hyakutake.

April 2. Mars will hover just one degree below Saturn this morning in Sagittarius one hour before sunrise. Then continue scanning to the west to see the nearly full moon and then Jupiter hanging in Libra the Scales.

April 7. Watch the waning gibbous moon directly above Saturn and Mars one hour before sunrise in the eastern sky this morning. Then watch it the next morning and you will see that it is 12 degrees farther east, or to the left of this pair of close planets. The Compton Gamma Ray observatory was launched on this day in 1991. Part of a whole family of 4 great space telescopes, this one studied the sky in the most energetic of all wavelength of light, gamma rays. It did discover about one new gamma ray burst randomly appearing in our sky each day during its 9-year life in orbit. Those are extremely powerful events caused by neutron star mergers or hyper novae explosions. NASA had to deorbit this wonderful space telescope on June 4 of 2000, after gathering great data and helping us make many new discoveries and expanding our knowledge of the invisible gamma ray universe after one of its 3 gyroscopes failed.

April 8. Last quarter moon is at 3:19 a.m. DST.

April 11. On this day in 1986, Halley's Comet made its closest approach to Earth. I saw it several times during that apparition, first spotting it on November 8 of 1985, exactly 329 years after his birth in 1656.

April 12. On this day in 1961, Yuri Gagarin became the first human to ever orbit the earth. John Glenn became the first American to orbit less than one year later, on February 20 of 1962.

April 15. New moon is at 9:58 p.m. DST.

April 17. Watch the waxing crescent moon directly below Venus this evening. Then watch the moon just below Aldebaran in the Pleiades the next evening.

April 18. Saturn rises in the east at around one in the morning. Saturn is now at aphelion, the farthest it has been from the sun since 1959 at just over one billion miles away.

April 22. The Lyrid meteor shower peaks this morning. The moon passes directly below the Beehive open star cluster in Cancer the crab this evening. First quarter moon is at 5:47 p.m.

April 25. The Hubble Space Telescope was deployed on this day in 1990. It is still operating efficiently now 28 years and over one million great pictures later.

April 29. Full moon is at 8:59 p.m. This is also called the Pink, Fish, Grass, or Egg Moon.

April 30. Frances Wright was born on this day in 1897. She was a Harvard astronomer who taught celestial navigation to naval officers and wrote 3 books on celestial navigation.

Moon Phases

April 8
Last Quarter

April 15
New

April 22
First Quarter

April 29
Full

Moon Data

Apr 3
Jupiter 4° south
of Moon

Apr 7
Saturn 1.9° south
of Moon

Mars 3° south
of Moon

Apr 8
Moon at apogee

Apr 12
Neptune 1.9° north
of Moon

Apr 14
Mercury 4° north
of Moon

Apr 17
Venus 5° north
of Moon

Apr 20
Moon at perigee

Submitted by Glenn Chaple

Sky Object of the Month – April 2018

(Courtesy LVAS Observer's Challenge*)

Messier 81 and 82 – Galaxy Pair in Ursa Major

Messier 81 (“Bode’s Galaxy; Magnitude 6.9; Size 27’ X 14’)

Messier 82 (“Cigar Galaxy”; Magnitude 8.4; Size 11’ X 4’)

When preparing a list of sky objects to show with my telescope at public star parties, I tend to avoid galaxies. To the uninitiated observer, a galaxy has the appearance of a hazy blob – for all the world, nothing more than fog remaining when someone breathed on the eyepiece. Even the great Andromeda Galaxy (Messier 31) fails to awe the first-time viewer.

I make an exception where the galaxies M81 and M82 are concerned. Sure, they’re still “faint fuzzies,” but the two are just 38 arc-minutes apart and appear together in the same low-power field. The sight of an oval-shaped patch (M81) next to a spindle-shaped one (M82) is intriguing at the very least.

M81 and M82 lie about 12 million light years distant. M81 is a spiral galaxy whose 90,000 light year diameter makes it slightly smaller than our Milky Way. Small aperture telescopes reveal the nucleus, while a 6-inch instrument will begin to show hints of the spiral arms. M82 is smaller, with a diameter of some 37,000 light years. For many years, M82 was thought to be an irregular galaxy. Recent studies hint at a spiral structure, the irregular appearance a result of an accelerated amount of star formation perhaps due to the gravitational influence of M82.

To locate M81 and M82, center your finderscope on an area marked by a line drawn from Phecda (gamma [γ] Ursae Majoris) through Dubhe (alpha [α] Ursae Majoris) and extended an equal distance beyond. A careful sweep with the finderscope or the main scope with a low-power eyepiece in place should reveal the two.

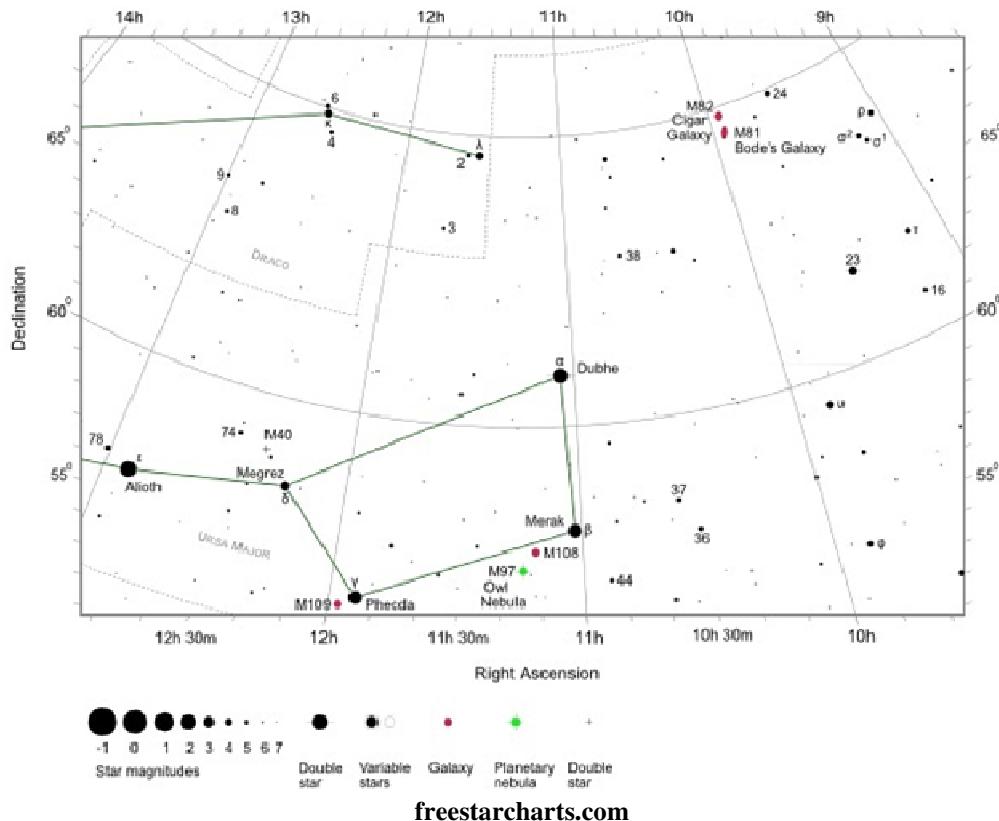
In the spring of 1993, a supernova was discovered in M81, reaching a peak magnitude of 10.5. In January, 2014, M82 got its turn, producing a supernova (2014J) that also reached magnitude 10.5.

If you live in a truly dark sky area (we’re talking about a place with a limiting magnitude in the order of 7.0!), try to see if you can pick out M81 with the unaided eye. A handful of amateur astronomers have accomplished this eagle-eyed feat, most notably *Astronomy* columnist Stephen James O’Meara.

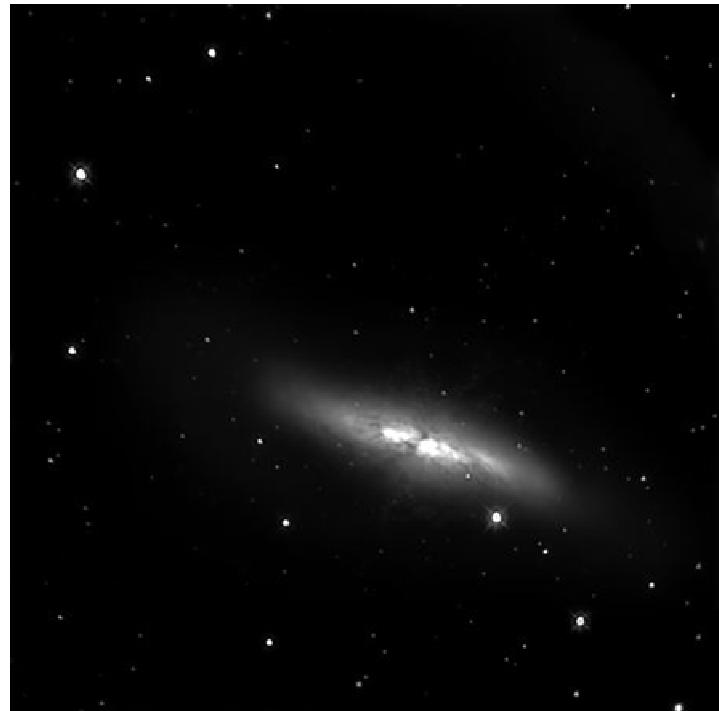
M81 and M82 were discovered by the German astronomer Johann Elert Bode on December 31, 1774, then independently by the French comet-hunter Pierre Méchain 5 years later. Méchain reported the pair to his contemporary Charles Messier, who observed and cataloged them in early 1781.

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Messier Finder Chart for M81 Bode's Galaxy and M82 Cigar Galaxy
 Also shown M40, M97 Owl Nebula, M108 and M109



freestarcharts.com



M81 (left) and M82 (right) Mario Motta M.D.

Principal Meteor Showers in 2018

January 4
Quadrantids

April 22
Lyrids

May 6
Eta Aquarids

July 30
Delta Aquarids

August 12
Perseids

October 9
Draconid

October 21
Orionids

November 9
Taurids

November 18
Leonids

November 26
Andromedids

December 14
Geminids

December 22
Ursids

*Note: Dates are
for maximum*

RED ALERT — Downward Pointing Lasers

NASA is planning to use (or is already using) downward pointing lasers which are mounted on their spacecrafts. For those of us who look at the night sky through a telescope, or a pair of binoculars, this is a potential hazard. If a laser beam enters our instrument at the very time we are viewing, eye injury or blindness could occur. Contact physicist, Dr. Jennifer Inman, jennifer.a.inman@nasa.gov and tell her your concerns about this perilous issue. Why should we have to live in fear each time we look into a telescope or a pair of binoculars? This is unacceptable!



The latest issue of the **Space Place Newsletter: News and Notes for Formal and Informal Educators** can be found at: <http://spaceplace.nasa.gov/en/educators>.

Space Place is a NASA website for elementary school-aged kids, their teachers, and their parents.

Check out our great sites for kids:



The Space Place website (<http://spaceplace.nasa.gov>)



The SciJinks Weather Laboratory at <http://scijinks.gov>



NASA Climate Kids at <http://climate.nasa.gov/kids>

Our Club has Merchandise for Sale at: www.cafepress.com/asnne



ALL money raised goes to our operating fund.

Any design can be put on any item.

Just let our club member, David Bianchi, know.

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!



Measuring the Movement of Water on Earth

By Teagan Wall

As far as we know, water is essential for every form of life. It's a simple molecule, and we know a lot about it. Water has two hydrogen atoms and one oxygen atom. It boils at 212° Fahrenheit (100° Celsius) and freezes at 32° Fahrenheit (0° Celsius). The Earth's surface is more than 70 percent covered in water.

On our planet, we find water at every stage: liquid, solid (ice), and gas (steam and vapor). Our bodies are mostly water. We use it to drink, bathe, clean, grow crops, make energy, and more. With everything it does, measuring where the water on Earth is, and how it moves, is no easy task.

The world's oceans, lakes, rivers and streams are water. However, there's also water frozen in the ice caps, glaciers, and icebergs. There's water held in the tiny spaces between rocks and soils deep underground. With so much water all over the planet—including some of it hidden where we can't see—NASA scientists have to get creative to study it all. One way that NASA will measure where all that water is and how it moves, is by launching a set of spacecraft this spring called GRACE-FO.

GRACE-FO stands for the “Gravity Recovery and Climate Experiment Follow-on.” “Follow-on” means it’s the second satellite mission like this—a follow-up to the original GRACE mission. GRACE-FO will use two satellites. One satellite will be about 137 miles (220 km) behind the other as they orbit the Earth. As the satellites move, the gravity of the Earth will pull on them.

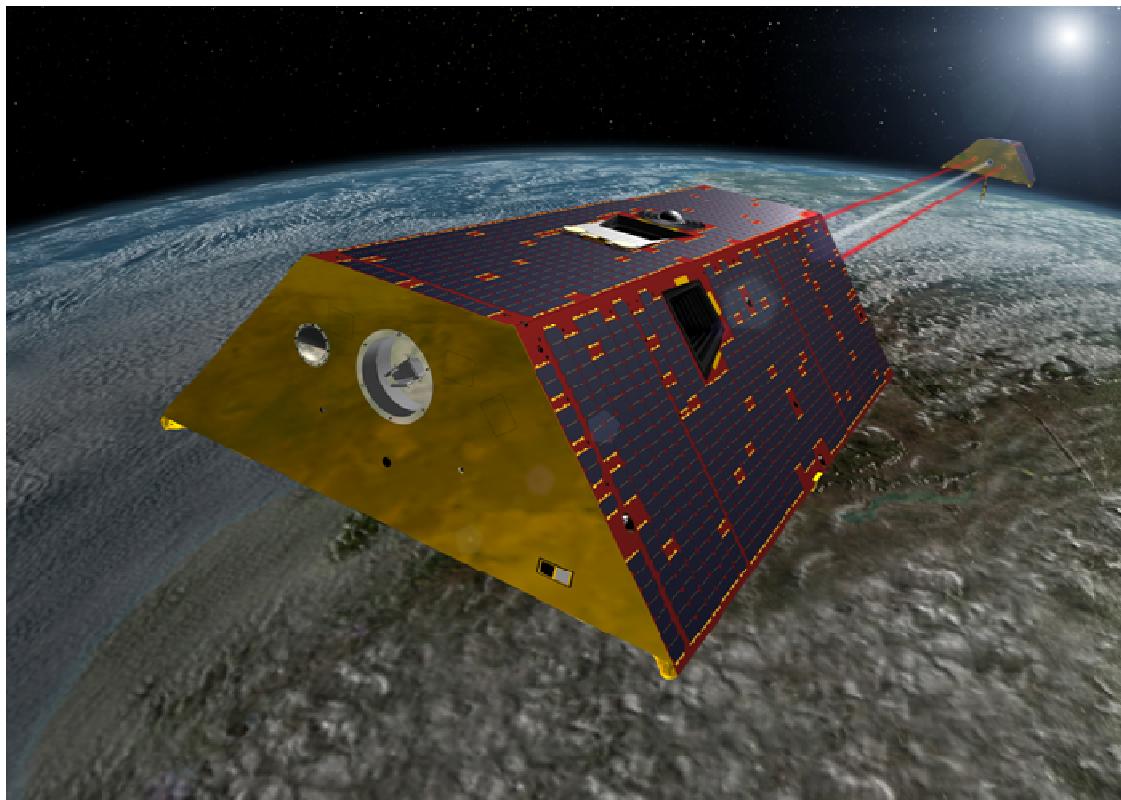
Gravity isn’t the same everywhere on Earth. Areas with more mass—like big mountains—have a stronger gravitational pull than areas with less mass. When the GRACE-FO satellites fly towards an area with stronger gravitational pull, the first satellite will be pulled a little faster. When the second GRACE-FO satellite reaches the stronger gravity area, it will be pulled faster, and catch up.

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Scientists combine this distance between the two satellites with lots of other information to create a map of Earth's gravity field each month. The changes in that map will tell them how land and water move on our planet. For example, a melting glacier will have less water, and so less mass, as it melts. Less mass means less gravitational pull, so the GRACE-FO satellites will have less distance between them. That data can be used to help scientists figure out if the glacier is melting.

GRACE-FO will also be able to look at how Earth's overall weather changes from year to year. For example, the satellite can monitor certain regions to help us figure out how severe a drought is. These satellites will help us keep track of one of the most important things to all life on this planet: water.

You can learn more about our planet's most important molecule here: <https://spaceplace.nasa.gov/water>



An artist's rendering of the twin GRACE-FO spacecraft in orbit around Earth. Credit: NASA

Point and Shoot Camera Astroimaging

Canon Powershot SX50 HS

Image submitted by Paul Kursewicz

Leo Triplet

Specs: 1200mm FL, ISO 1600, 24 x 1min 30sec exposures, 03-19-18



This popular group is known as the Leo Triplet. A group of interacting spiral galaxies located in the constellation Leo. Left to right, NGC 3628 (aka, The Hamburger Galaxy), M66, and M65. The Triplet lies at a distance of 35 million light years from Earth. These can be easily seen in a small telescope. M66 is the largest and brightest member and is roughly 95 light years across. M65 is an intermediate spiral galaxy, poor in dust and gas, and shows little evidence of star formation. NGC 3628 is an unbarred spiral galaxy. Seen edge-on, the galaxy appears transected by a broad band of dust that stretches along its outer edge, hiding the young stars in the galaxy's spiral arms. The three galaxies have all been affected by gravitational interactions with each other. This is evident in the deformed, drawn out spiral arms of M66 that are experiencing a high rate of star forming activity. The Trio is probably physically related to the M96 Group.

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Cropped**Leo Quartet**

Single image unedited (bottom cropped). The Trio is to the left and a fourth galaxy NGC3593 is to the upper right. Specs: Around 600mm FL, ISO 1600, 2min 30sec exposure, 3-18-18. Some sources say that NGC3593 belongs to the Leo Triplet group.

Club Meeting & Star Party Dates

Date	Subject	Location
April 6	<p><u>ASNNE Club Meeting:</u> Business Meeting starts at 6:00PM 6:30-7:15PM: Starlady Joan Chamberlin conducts a basic astronomy class prior to the meeting. 7:30-9:30PM: Club Meeting</p> <p><u>Meeting Agenda</u></p> <p>Guest speaker - Jon Wallace Topic: Meteorites – Hunting and Identification Come and have an 'out of this world' experience – literally! See rocks that have fallen to Earth from asteroids, Mars, and the Moon, as well as meteorites found in Maine. Find out how we search for them and details about the fireball seen over Maine in 2016. You'll also get to start your own collection with a free meteorite specimen (while supplies last)!</p> <p>Bernie Reim - What's UP Astro Shorts: (news, stories, jokes, reports, questions, photos, observations etc.)</p>	The New School, Kennebunk, Me.
April 27	Club/Public Star Party <i>Check List-serve / website for updates and or cancellations</i>	Starfield Observatory, West Kennebunk, Me.

Directions to ASNNE event locations

Directions to The New School in Kennebunk [38 York Street (Rt1) Kennebunk, ME]

For directions to The New School you can use this link to the ASNNE NSN page and then click on "get directions" from the meeting location. Enter your starting location to generate a road map with complete directions. It works great. http://nightsky.jpl.nasa.gov/club-view.cfm?Club_ID=137

Directions to Starfield Observatory [Alewife Road, Kennebunk, ME]

From North:

Get off turnpike at exit 32, (Biddeford) turn right on Rt 111. Go 5 miles and turn left on Rt 35. Go 2 miles on Rt 35 over Kennebunk River to very sharp 90 degree left turn. The entrance to the Starfield Observatory site is at the telephone pole at the beginning of the large field on the left. Look for the ASNNE sign on the pole.

From South:

Get off the turnpike at exit 25 in Kennebunk. After toll both turn right on Rt 35. Go up over the turnpike and immediately turn right on Rt 35. About 4 miles along you will crest a hill and see a large field on your right. Continue until you reach the end of the field. Turn right into the Starfield Observatory site at the last telephone pole along the field. Look for the ASNNE sign on the pole. If you come to a very sharp 90 degree right turn you have just passed the field.

To join ASNNE, please fill out the below membership form. *Checks should be made payable to: Astronomical Society of Northern New England (A.S.N.N.E).* For more details, please visit our website:

<http://www.asnne.org>



Astronomical Society of Northern New England
P.O. Box 1338
Kennebunk, ME 04043-1338

2018 Membership Registration Form

(Print, fill out and mail to address above)

Name(s for family): _____

Address: _____

City/State: _____ Zip code: _____

Telephone # _____

E-mail: _____

Membership (check one):

Individual \$35 _____ Family \$ 40 _____ Student under 21 years of age \$10 _____ Donation _____

Total Enclosed _____

Tell us about yourself:

1. Experience level: Beginner _____ Some Experience _____ Advanced _____

2. Do you own any equipment? (Y/N) And if so, what types?

3. Do you have any special interests in Astronomy?

4. What do you hope to gain by joining ASNNE?

5. How could ASNNE best help you pursue your interest in Astronomy?

6. ASNNE's principal mission is public education. We hold many star parties for schools and the general public for which we need volunteers for a variety of tasks, from operating telescopes to registering guests to parking cars. Would you be interested in helping?

Yes _____ No _____

7. ASNNE maintains a members-only section of its web site for names, addresses and interests of members as a way for members to contact each other. Your information will not be used for any other purpose. Can we add your information to that portion of our web site?

Yes _____ No _____

