

# Skylights

Newsletter of the Astronomical Society of Northern New England



June 2020



Member of NASA's  
Night Sky Network



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 June

By Bernie Reim

**T**he month of June is named for Juno, the Roman queen of the gods and patroness of marriage and weddings. According to myth, Juno had the power to see through a veil of clouds that Zeus put up, so our latest mission to Jupiter was named Juno since it does much the same thing for us today except that Juno uses scientific instruments that humans designed using the principles of mathematics and physics instead of magic.

This month also always marks the beginning of summer for us in the northern hemisphere. This year that will happen on Saturday, June 20 at 5:44 p.m. That marks the longest day and shortest night of the year as the sun reaches its highest point at about 67 degrees, which is our latitude plus the tilt of the earth.

There will be many interesting highlights this month to get us outside under the warmer skies and shorter nights. These include Venus returning to the morning sky and being occulted by the moon, Mars getting close and bright enough to start distinguishing some features already, some nice conjunctions with the moon and Jupiter and Saturn in the morning even as they both become late evening planets, a penumbral lunar eclipse, an annular eclipse of the sun, and two comets.

Venus went through inferior conjunction with the sun on June 3 and is now rapidly climbing into the morning sky. It is getting smaller and more illuminated by the sun each day even as it also gets brighter. On the morning of the 19<sup>th</sup>, the day before summer starts, Venus will be occulted by the moon. This will occur after sunrise in some places on Earth, but we will not be able to see that from here. I did watch a daytime occultation of Venus by the moon once about 20 years ago. It was a very dramatic event through a telescope and getting a sense of the real time motion of the moon. An even better way to sense that constant 2,000 mile-per-hour motion of the moon through our sky is just before a total solar eclipse as its shadow sweeps right over you at that speed and also during an annular eclipse as you watch it move rapidly across the sun, but it doesn't cast a shadow on the earth during an annular eclipse because it is too far away, closer to apogee than perigee.

Since the dramatic exit of a very large and thin crescent Venus from our evening sky late last month, only Mercury remains now as our sole evening planet. I watched and photographed the great

conjunction of our first planet with Venus unfold for 6 perfectly clear nights in a row last month. Mercury got within just one degree or twice the width of the full moon, of Venus on the 21<sup>st</sup> and then kept moving higher past Venus each evening at the rate of about one degree per day. The best night was when a very slender waxing crescent moon with its ethereal earthshine joined the pair of our only inferior planets that also have phases just like the moon.

It was great to be able to capture many pictures of this continuing event even as I could see their reflections spread out over the calm surface of a lake along with many families of Canada geese out cruising each evening seemingly enjoying the same spectacle, but just without the knowledge of what those two bright lights really were or any of the myriad of stars that quickly started to emerge each evening at that time. Sometimes I wonder if we as humans can even grasp the full significance of what the earth is or any of the other planets or any of the stars that we take for granted without really understanding their enormous power or what that means for us directly and individually.

For half of those evenings I also heard and saw a pair of loons, their plaintive and piercing calls harmonizing and echoing across the lake,

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## **Club Contacts**

### **Officers:**

#### **President:**

Ron Burk  
rdavidburk@yahoo.com

#### **Vice President:**

Bernie Reim  
berniereim@kw.com

#### **Secretary:**

Carl Gurtman  
carlgurt@msn.com

#### **Treasurer:**

Ian Durham  
idurham@anselm.edu

#### **Board of Directors:**

Gary Asperschlager  
gasperschlager@gmail.com

Larry Burkett  
larrybu32@yahoo.com

Keith Brown  
silverado93@twc.com

#### **Star Party**

#### **Co-ordinator:**

Carl Gurtman  
carlgurt@msn.com

#### **Skylights Editor:**

Paul Kursewicz  
pkursewicz@myfairpoint.net

#### **Website Manager:**

Nan Musgrave  
mzgrvz@outlook.com

#### **NASA Night Sky Network**

#### **Co-ordinator:**

Joan Chamberlin  
starladyjoan@yahoo.com

#### **JPL Solar System Ambassador:**

Joan Chamberlin  
starladyjoan@yahoo.com

### **What's Up "Continued from page 1"**

evoking the spirit of this lake nestled in the mountains. Virtually unchanged for millions of years, the loon is the most primitive bird on Earth, with a fossil record that dates back over 70 million years, even before the dinosaurs went extinct. Their haunting and mournful calls could be interpreted poetically as the earth responding in an audible way to the beauty of the stars and the moon and planets above and all around it and as the earth being in constant communication with the rest of the universe.

By the middle of this month Mars will be rising just after midnight and it is now getting close and large enough to start seeing some detail emerge on its surface through a telescope. The red planet will reach its opposition on October 6. The last one was in July of 2018. That was a very close opposition because Mars was also near its perihelion to the sun at the time. This one will not be quite as good, but it will still be the best one until 2035.

Jupiter and Saturn now rise within 15 minutes of each other just before midnight. By the end of the month they will be rising about an hour after sunset. They are both in retrograde motion now approaching their oppositions next month. They are both still getting higher and brighter and closer to Earth. Watch a waning gibbous moon pass right under Jupiter on the 8<sup>th</sup> and right under Saturn on the 9<sup>th</sup>.

Since it is eclipse season again, we will get two eclipses this month, a penumbral lunar and an annular solar eclipse, but neither one will be visible anywhere over this country. Due to the "magic" of the internet and communications satellites, we can still watch both of these events live on channels like NASA and slooh.com and many others, but it is not the same as being there in person for the full experience that everyone would interpret differently. I can certainly attest to that having directly witnessed the American solar eclipse over Idaho nearly 3 years ago. It was a completely above-this-world and into-the-wider-solar system and universe experience that you could never get just by watching it. You have to be there and participate in the event and let it teach you more about what is really happening all the time.

The annular eclipse will take place at new moon on the 21<sup>st</sup>, the day after the summer solstice. It will start in central Africa and end over Taiwan. The moon is near apogee, so it will be just a little too small and far away to completely cover the sun. It will create a brilliantly glowing ring around the sun, sometimes called a ring of fire. You might even be able to see Bailey's beads and some prominences, but the living and pulsing corona or atmosphere of the sun will not be blazing forth in all of its glory, reaching way out into space many times its diameter. This living atmosphere truly dominated the scene during the solar eclipse over Idaho and seemed to be reaching all

the way to the earth and well beyond, revealing just a little of the true beauty and constant power of the sun along with the vast scale and enormous motions of all the planets and our moon. It was like being freely given an honored glimpse for two-and-a-half minutes of what is really happening all the time.

The lunar eclipse will only be a partial penumbral one that will happen at full moon on the 5<sup>th</sup>. I have seen many total lunar eclipses since they are much more common than total solar eclipses and they are visible over half the earth instead of just a narrow path less than 100 miles wide. They are not nearly as dramatic or enlightening as solar eclipses, but they do reveal an interesting glimpse into the nature of Earth's atmosphere as you watch our colorful shadow slowly sweep across the moon, essentially enabling you to see all of the sunrises and sunsets on Earth simultaneously projected onto the moon.

Comet Swan is visible in Perseus and Comet PanSTARRS is just entering the Big Dipper this month. They should be visible with just a pair of binoculars.

June 3. The Hale 200-inch telescope at Mt. Palomar was dedicated on this day in 1948.

June 4. On this day in the year 2000 the Compton Gamma Ray telescope re-entered our atmosphere after 10 years of fantastic observations of high-energy events in our universe.

June 5. Full moon is at 3:13 p.m. EDT. This is also called the Rose or Strawberry Moon. On this day in 1989 Voyager 2 made its closest encounter with Neptune. The last transit of Venus until the year 2117 across the face of the sun happened on this day in 2012.

June 13. The last quarter moon is on 2:25 a.m. It will pass close to Mars this morning. Pioneer 10 left the solar system on this day in 1983. That is about 120 a.u. away or 4 times farther out than Pluto. That is about 18 hours at the speed of light.

June 16. On this day in 1963 Valentina Tereshkova became the first woman in space.

June 19. Venus is occulted by the moon this morning.

June 20. Summer starts at 5:44 p.m.

June 21. New moon is at 2:42 a.m. An annular solar eclipse happens today.

June 29. George Ellery Hale was born on this day in 1868. He designed and created the four biggest telescopes in the world, starting with his 40-inch refractor at Yerkes and ending with his 200-inch reflector at Palomar.

June 30. On this day in 1908 a comet or asteroid became brighter than the sun as it exploded a few miles about Tunguska, Siberia with the force of 20 megatons of TNT, or 1000 times the force of our first atomic bomb. It devastated an area of 1000 square miles and destroyed 80 million trees but never left a crater. A lot of mystery still surrounds this event. A similar event on a much smaller scale in nearly the same area happened on Feb. 15, 2013, as an asteroid 65 feet across exploded over Chelyabinsk, Russia.

Moon Phases

**June 5**  
Full

**June 13**  
Last Quarter

**June 21**  
New

**June 28**  
First Quarter

Moon Data

**June 2**  
Moon at perigee

**June 8**  
Jupiter 2° north  
of Moon

Saturn 3° north  
of Moon

**June 12**  
Mars 3° north  
of Moon  
  
Neptune 4° north  
of Moon

**June 14**  
Moon at apogee

**June 16**  
Uranus 4° north  
of Moon

**June 19**  
Venus 0.7° south  
of Moon

**June 29**  
Moon at perigee

**OBSERVER'S CHALLENGE\* – June, 2020**

by Glenn Chaple

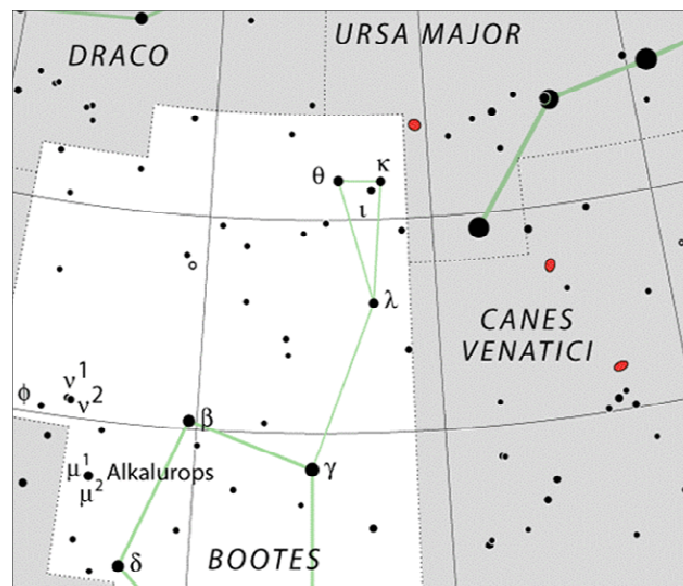
**NGC 5689 – Lenticular Galaxy in Boötes (Mag: 11.9 Size: 3.3' X 1.0')**

June is a difficult month for backyard astronomers here in the northern hemisphere. We battle fatigue (June sunsets are the latest of the year), haze and humidity, and – mosquitos. While yawning, sweating, and swatting, you'll be struggling to glimpse this month's Observer's Challenge, the 12<sup>th</sup> magnitude lenticular galaxy NGC 5689.

I went after NGC 5689 with a 10-inch f/5 reflector on a clear, moonless evening under typical suburban skies (limiting magnitude 5). To find the galaxy, I star-hopped, beginning from a triangle made up of the stars kappa ( $\kappa$ ), iota ( $\iota$ ), and theta ( $\theta$ ), Boötis, located in the upper northwest corner of Boötes and east of the handle of the Big Dipper. From there, I traced a path to the 6<sup>th</sup> magnitude stars 24 Boötis and SAO45121. At 139X and using averted vision, I could barely make out a ghostly glow less than a degree south and slightly east of the latter star. The glimpses were so fleeting that I was unable to capture any detail. If I were to tackle NGC 5689 again, I would observe from a much darker site.

If you're limited to a small-aperture scope and/or skies compromised by artificial lighting, I encourage you to check out a trio of nearby double stars shown in Finder Chart B. Kappa ( $\kappa$ ) Boötis is a charming magnitude 4.5 and 6.6 pair separated by 13.7 arc-seconds. Less than a degree southeast is iota ( $\iota$ ) Boötis whose magnitude 4.8 and 7.4 components are a roomy 38.9" apart. Both pairs are easily split at 30X. You'll need a boost in magnification (100X or more) to split 39 Boötis. In 2019, this magnitude 6.3 and 6.7 duo was separated by a mere 2.5". Both are mid F-class main sequence stars. Are you able to detect a subtle off-yellow hue?

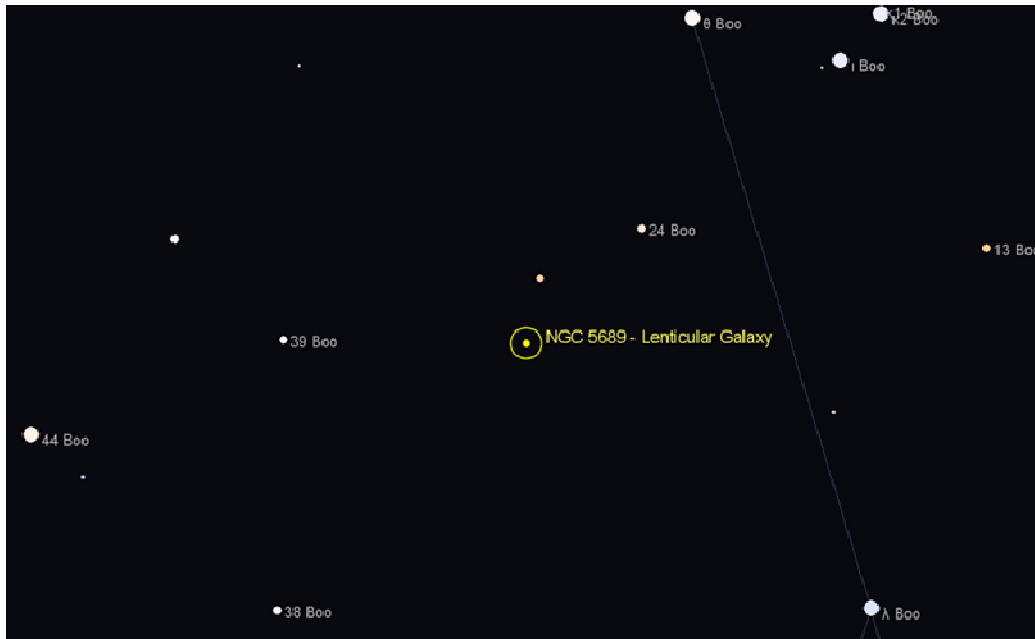
NGC 5689 was discovered by William Herschel in 1787. Sources place its distance as somewhere between 100 and 120 million light years. In either case, the photons striking your retina left when dinosaurs ruled the earth.

**Finder charts for NGC 5689****Chart A**

constellation-guide.com (from IAU and Sky and Telescope)

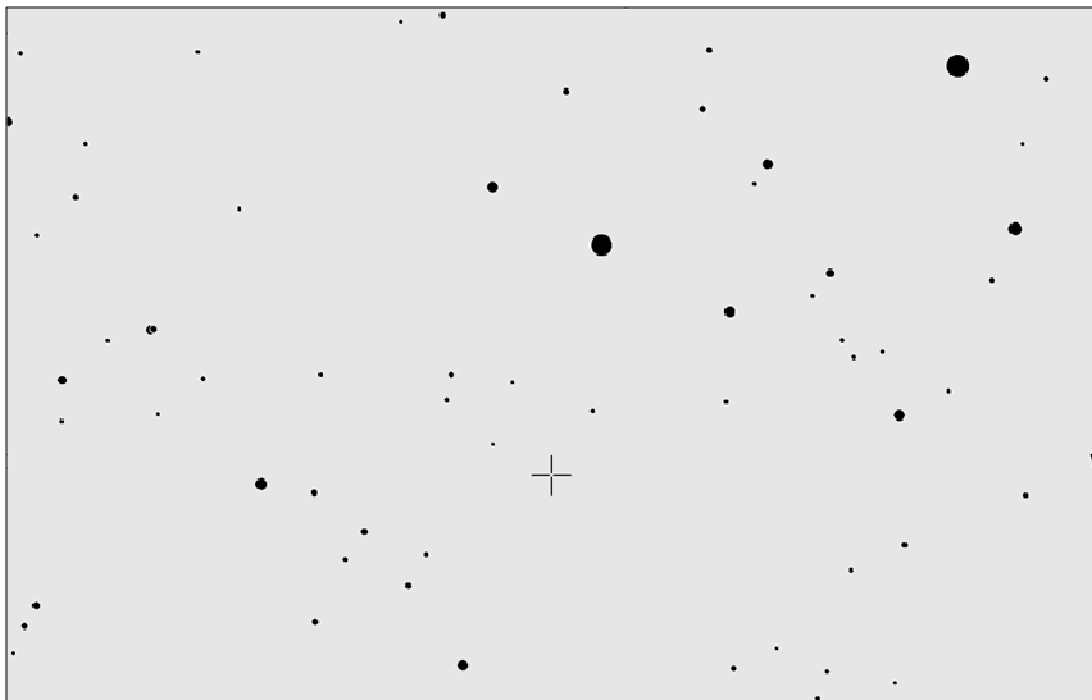
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Chart B



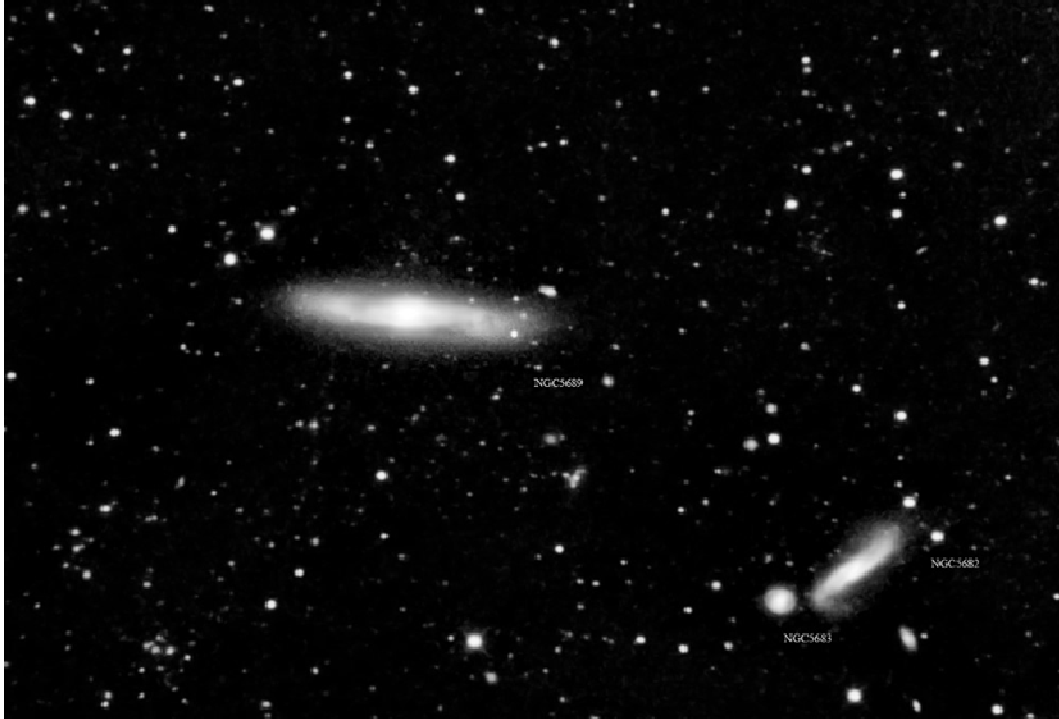
theskylive.com

Chart C



From AAVSO Variable Star Plotter. Stars plotted to magnitude 11. North is up in this 2° by 3° field. Bright star at upper right is 24 Boötis. Bright star above center is SAO 45121.

*“Continued on page 5”*



**Image by Mario Motta (ATMoB) Taken through 32 inch scope with ZWO ASI6200 camera, 45 minutes total integration time, processed in PixInsight.**

\*The purpose of the Observer's Challenge is to encourage the pursuit of visual observing. It is open to everyone who is interested. If you'd like to contribute notes, drawings, or photographs, we'll be happy to include them in our monthly summary. Submit your observing notes, sketches, and/or images to either Roger Ivester ([rogerivester@me.com](mailto:rogerivester@me.com)) or Fred Rayworth ([queex@embarqmail.com](mailto:queex@embarqmail.com) or [fred@fredrayworth.com](mailto:fred@fredrayworth.com)). To find out more about the Observer's Challenge or access past reports, log on to [rogerivester.com/category/observers-challenge-reports](http://rogerivester.com/category/observers-challenge-reports).

## Principal Meteor Showers in 2020

**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

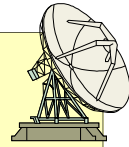
**November 26**  
Andromedids

**December 14**  
Geminids

**December 22**  
Ursids

*Note: Dates are  
for maximum*

Got any News?  
Skylights Welcomes Your Input.



*Here are some suggestions:*

*Book reviews -- Items for sale -- New equipment --  
Ramblings -- Star parties -- Observing -- Photos.*

**Our Club has Merchandise for Sale at: [www.cafepress.com/asne](http://www.cafepress.com/asne)**



*ALL money raised goes to our operating fund.  
Any design can be put on any item.*

Contact David Bianchi [dadsnorlax@yahoo.com](mailto:dadsnorlax@yahoo.com) for further details.

## 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](mailto: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!



**This article is distributed by NASA Night Sky Network**

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit [nightsky.jpl.nasa.org](https://nightsky.jpl.nasa.org) to find local clubs, events, and more!

## Summer Triangle Corner: Vega

By David Prosper and Vivian White

If you live in the Northern Hemisphere and look up during June evenings, you'll see the brilliant star **Vega** shining overhead. Did you know that Vega is one of the most studied stars in our skies? As one of the brightest summer stars, Vega has fascinated astronomers for thousands of years.

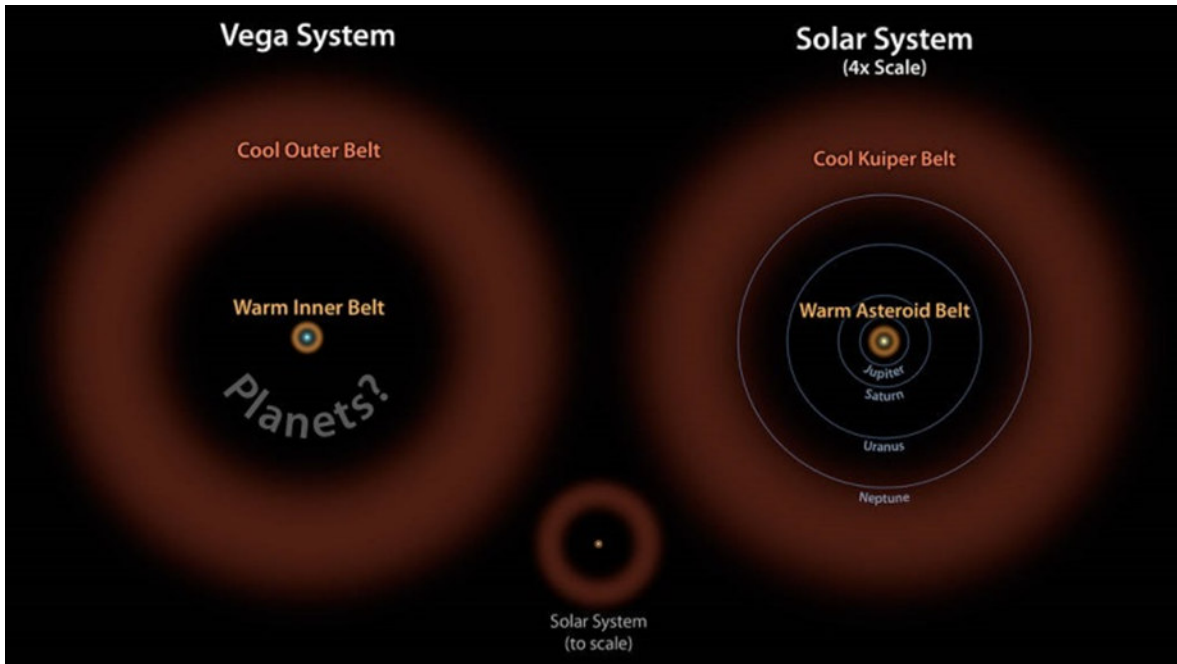
Vega is the brightest star in the small Greek constellation of Lyra, the harp. It's also one of the three points of the large "Summer Triangle" asterism, making Vega one of the easiest stars to find for novice stargazers. Ancient humans from 14,000 years ago likely knew Vega for another reason: it was the Earth's northern pole star! Compare Vega's current position with that of the current north star, Polaris, and you can see how much the Earth's tilt changes over thousands of years. This slow movement is called **precession**, and in 12,000 years Vega will return to the northern pole star position.

Bright Vega has been observed closely since the beginning of modern astronomy and even helped to set the standard for the current magnitude scale used to categorize the brightness of stars. Polaris and Vega have something else in common, besides being once and future pole stars: their brightness varies over time, making them **variable stars**. Variable stars' light can change for many different reasons. Dust, smaller stars, or even planets may block the light we see from the star. Or the star itself might be unstable with active sunspots, expansions, or eruptions changing its brightness. Most stars are so far away that we only record the change in light, and can't see their surface.

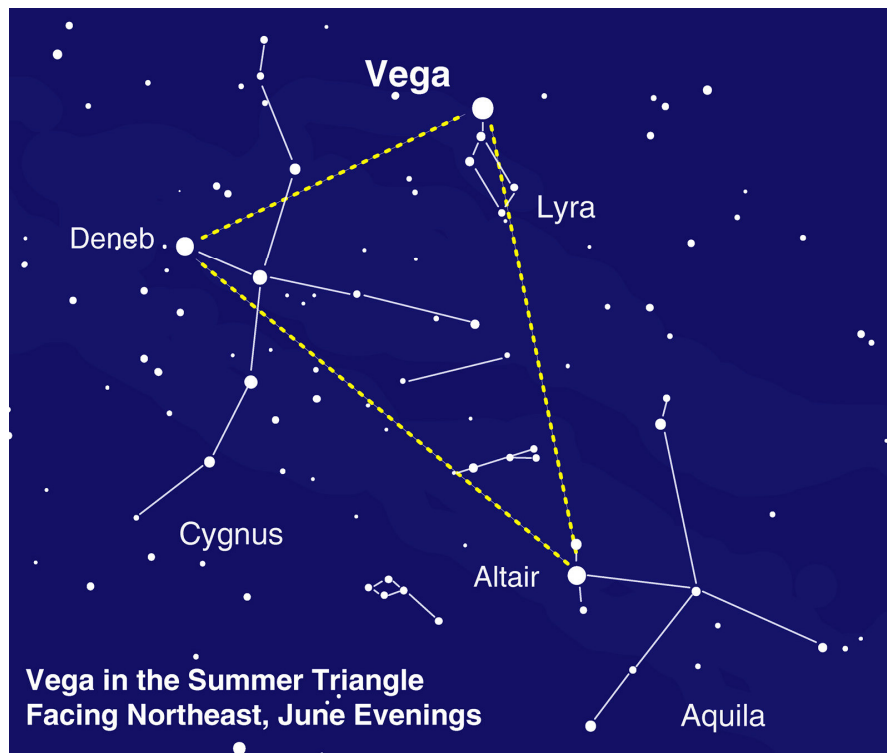
NASA's TESS satellite has ultra-sensitive light sensors primed to look for the tiny dimming of starlight caused by transits of extrasolar planets. Their sensitivity also allowed TESS to observe much smaller pulsations in a certain type of variable star's light than previously observed. These observations of **Delta Scuti** variable stars will help astronomers model their complex interiors and make sense of their distinct, seemingly chaotic, pulsations. This is a major contribution towards the field of astroseismology: the study of stellar interiors via observations of how sound waves "sing" as they travel through stars. The findings may help settle the debate over what kind of variable star Vega is. Find more details on this research, including a sonification demo that lets you "hear" the heartbeat of one of these stars, at: [bit.ly/DeltaScutiTESS](https://bit.ly/DeltaScutiTESS)

Interested in learning more about variable stars? Want to observe their changing brightness? Check out the website for the American Association of Variable Star Observers (AAVSO) at [aavso.org](https://aavso.org). You can also find the latest news about Vega and other fascinating stars at [nasa.gov](https://nasa.gov).

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*Vega possesses two debris fields, similar to our own solar system's asteroid and Kuiper belts. Astronomers continue to hunt for planets orbiting Vega, but as of May 2020 none have been confirmed. More info: [bit.ly/VegaSystem](https://bit.ly/VegaSystem) Credit: NASA/JPL-Caltech*



*Can you spot Vega? You may need to look straight up to find it, especially if observing after midnight.*



## Point and Shoot Camera Astroimaging (no telescope)

### Canon Powershot SX50 HS

*Image & write-up submitted by Paul Kursewicz*

**Napoleon's Hat**

**Specs: RAW, f/3.5, FL 400mm, ISO 1600, 10 x 1 min, 5-20-20**



The obvious elephant in the room is the very beautiful and bright star Arcturus, located in the constellation Bootes. Near this star is a small asterism called **Napoleon's Hat**. I slightly cropped my image in order to see the asterism better. It is composed of 7 stars in the shape of the Emperor's Hat. In my picture it is located about four Arcturus diameters from the 5-O'clock position. French Astronomer Fulbert Picot discovered this interesting seven star grouping (some listings call it Picot 1). It is difficult to see if Arcturus is in field of view. I could not see it in my 12 x 36 binoculars. A telescope and or bigger binoculars will be needed to see it. As an aside, one of Napoleon Bonaparte's signature two-cornered hats, known as a "bicorne" and made of black-felted beaver fur, went to auction in 2014 and fetched \$2.4 million dollars. While the bicorne was common among military men, Napoleon donned his in a distinctive style. Napoleon wore his bicorne hats in a different way to everybody else and that was sideways. He did this to make himself stand out and be easily identified.

*"Continued on page 10"*

**International Space Station****Specs: RAW, f/3.5, FL 102mm, ISO 1600, 6 sec, 5-30-20**

I took this picture last night of the **International Space Station**. Exposed for 6 seconds. It had a magnitude of  $-3.8$  (very bright). It arrived at its highest point right on time, at 9:53 pm. The **Crew Dragon** made its pass a bit earlier at 9:47 pm. However, I was not able to spot it. Having a magnitude of zero, and a very bright Moon high in the sky, made conditions difficult for spotting it. The capsule hooked up with the Space Station at 10:16 am this morning (5-31-20).

## Club Meeting & Star Party Dates

Date	Subject	Location
<u>June 5</u>	<p><b><u>ASNNE Club Meeting:</u></b></p> <p><b>Our June Club meeting at The New School has been cancelled due to the Coronavirus.</b></p> <p><b>There are plans in the making to still have our Club Meeting while staying at home by using ZOOM.</b></p> <p>So, a computer or a phone will be required. Ian Durham has volunteered to organize all of this. As we get closer to Friday, Ian will post a connection link to join Zoom.</p> <p><b>Topic:</b> Ian Durham will give a presentation on “Stellar Nucleosynthesis.”</p>	<u>The New School, Kennebunk, Me.</u>
<u>Last Month</u>	<p>At our Zoom meeting last month Bernie Reim gave his “What’s Up” talk. Following Bernie, Paul Kursewicz did the Constellation of the Month — “Leo.” The rest of the meeting was devoted to astro-shorts.</p>	
<u>TBD</u>	<b>Club/Public Star Party: Cancelled due to the Coronavirus.</b>	Talmage Observatory at Starfield 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](http://nightsky.jpl.nasa.gov/club-view.cfm?Club_ID=137)

**Directions to Talmage Observatory at Starfield** [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

**2020 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 \_\_\_\_\_

