Roanoke Valley Astronomical Society

Amateur Astronomy News and Views
In Southwestern Virginia

Volume 40—Number 6 June 2023

RVAS May Meeting Notes

Asteroid Occultations

By **Mike Hutkin, RVAS President**

The Celestial Café was opened at 7:00 pm by **President Mike Hutkin**. The Celestial Café is always a fun and engaging time where members and officers can catch up and tonight was no different. Members and officers spoke about various topics within astronomy, astrophotography, and big updates in their personal lives.

Unfortunately, due to an operator error this month, there is no recording of the Café discussion to share and notes had not been taken. Mea Culpa.

At 7:30, the Café closed and Mike, along with our Membership Coordinator, **Frank Baratta,** welcomed members and guests to the March meeting. To begin, Mike presented the evening's agenda and introduced the other club officers: **John Wenskovitch, Vice President; Sasha Mintz, Secretary; Frank Baratta, Treasurer; Nancy Vogelaar, Member-At-Large;** and our other Executive Committee members, **John Goss, Immediate Past President; and Michael Martin, Past President,** also recognizing **Dave Thomas** as our Newsletter and Webmaster.

Attendance: There were 33 members and 2 guests in attendance at this month's meeting. 18 were in person and 17 attended virtually. As membership coordinator, **Frank Baratta** welcomed our guests.

Astrophotography:

To make sure we allowed sufficient time for the speaker tonight, we did not show the astrophotography work this month but want to share the work our members had done, regardless.

*In-person attendees – **Zoom photo***

We thank **Ed Dixon, Harry Kessler, Michael Martin, and Dave Thomas** for providing their work this month. We had a variety of images focusing on the sun, the moon, and a few deep-sky objects.

*Moon shot – **Michael Martin photo***

(Meeting Continued on page 2)

(Meeting Continued from page 1)

To provide each image with the focus it deserves, we are sharing the submissions in a separate article in this newsletter. Don't miss checking out the rest of these images.

Member Observation Reports:

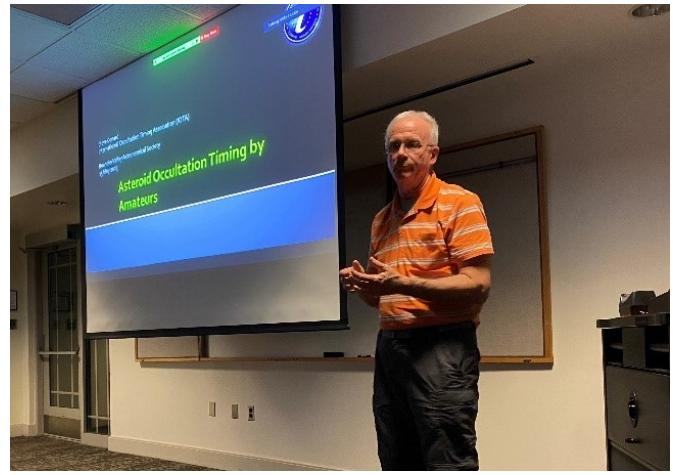
There were no reports but Mike did alert the group to a proposed observing session Friday night May 19 (Rain date May 20) at the Cahas overlook. An email with details would be sent out on Tuesday morning to gauge interest.

What's Up?:

Mike then asked Frank Baratta for our sky review for the coming month. Frank's program for June included a new layout of data for the moon and the Sun and the planets. His selection of June celestial events centered on the solstice and the separate dates of the earliest sunrise and latest sunset. Also highlighted were opportunities for viewing Venus and Mars, individually or together with the moon. Frank switched from his mid-month sky map to separate maps for the 1st and the 30th, to show the changes over the 30 days. He concluded with a sky map and selected viewing targets for May 19th/20th, the date of the observing session the club was in the process of organizing. For details, see the "What's Up? Highlights" in this issue and the complete PowerPoint by clicking here.

Program: It was now time for our monthly program which was presented by **Steve Conard**.

Steve is a member of the Principal Professional Staff at the Johns Hopkins University Applied Physics Laboratory. He has over 35 years of experience building, testing, and operating optical instrumentation for astrophysics and planetary space missions. He has been the lead engineer for the Long Range Reconnaissance Imager (LORRI) on the



***Steve Conard** begins his talk – **Mike Hutkin** photo*

New Horizons mission since 2003. Before joining APL in 2002, he was with The Johns Hopkins University's Department of Physics and Astronomy for 20 years.

Steve is no stranger to the RVAS, having spoken to us in the past with his last discussion being in 2020. His talk tonight focused on the technique used to determine the size & shape of asteroids as well as measurable objects like the dimensions of mountains on the moon.

Steve started by showing an example of a star being occulted by a Jupiter trojan asteroid which is in a large group of asteroids that share Jupiter's orbit around the sun. Steve covered the following items in his talk:

- What are occultations?
- 'Why time them?
- The basic data collection steps

(Meeting Continued on page 3)

The Roanoke Valley Astronomical Society is a membership organization of amateur astronomers dedicated to the pursuit of observational and photographic astronomical activities. **Meetings are held at 7:30 p.m. on the third Monday of each month. See calendar on last page of newsletter for location. Meetings are open to the public.** Observing sessions are held one or two weekends a month at a dark-sky site. For information regarding joining RVAS, including annual dues, click here. Articles, quotes, etc. published in the newsletter do not necessarily reflect the views of the RVAS or its editor.

(Meeting Continued from page 2)

- That the shape may be known but this process helps determine size and helps refine orbital data
- That this is a hobby driven by amateurs
- How RVAS members can help with the project
- That software algorithms do much of the calculation work and analysis. People provide the data The need for multiple people performing the measurement from different locations
- That having more data achieves more accurate measurement
- The need for a GPS time source
- That quality of data checks are performed to assure conformity to the process.
- Steve showed us examples of collected data
- Data is published; September 2016 Sky & Telescope magazine
- This data is combined with light curve data to enhance the shape data
- Some unexpected discoveries have been found along the way
- Hardware requirements
- IOTA – the International Occultation Timing Association https://www.astroleague.org/content/occultation-observing-program

After his talk, Steve showed the group some of the equipment he uses.

Steve's talk can be viewed here .

Next month: We will be treated to a presentation by our own **John Wenskovitch**, who will talk about Open Clusters.

The meeting was adjourned at 9:05 pm

***Steve Conard** shows off some of his equipment – **Mike Hutkin** photo*

RVAS Elections Proposed Slate!

It's that time of year again—Elections! The Nominating Committee proposes the following slate of candidates:

President – Mike Hutkin (current President)
Vice President – John Wenskovitch (current Vice President)
Secretary – Erin Elliott
Treasurer – Frank Baratta (current Treasurer)
Executive Committee Member at Large – Nancy Vogelaar (current EC MaL)

Any adult member (age 18 or older) in good standing who wishes to the run for an RVAS office is welcomed and encouraged to do so. Simply send to nominatingcommittee@rvasclub.org an e-mail indicating the office for which you want to run and briefly describing why you're interested in running. In order to be added to the list of candidates, your e-mail must be received within 15 calendar days following the publication of this newsletter, that is, by 11:59 p.m. June 16, 2023.

RVAS Member Anniversaries

Congratulations to the following members who reach the indicated number of consecutive years with the RVAS since joining or re-joining during the month of June:

Melanie Minnix (1994) – 29 years
Clark Thomas (2002) – 21 years *
Michael and Lauren Martin (2016) – 7 years
Rick Parker (2017) – 6 years
Todd Atkins (2018) – 5 years
Al and Beth Durham (2018) – 5 years **
John Sheffey (2018) – 5 years
Robert Murray (2021) – 2 years

* Clark was a youth member in the late 1950s of the Amateur Astronomers of Roanoke, an ancestor club of the current RVAS!
** Al and Beth were also RVAS members from Nov. 1995 to June 2009.

Thanks to all of you for being RVAS members!

Use Our Message Line!

Want to check whether anyone is getting out on a scheduled observing session night or share that you're planning to do so? Have questions about the club or need its assistance? Call the RVAS Message Line, 540 -774-5651, and leave a message or listen for any information available.

Wanted

Astro photos for publication on the RVAS Web page, or in the RVAS Newsletter. Send the photos to editor@rvasclub.org. Observing reports and articles are also welcome.

The RVAS Astro-photographers

May 2023

There is a table with pertinent information after the pictures

ED DIXON – 1

HARRY KESSLER – 2

Michael Martin – 3

Michael Martin – 4

Dave Thomas – 5

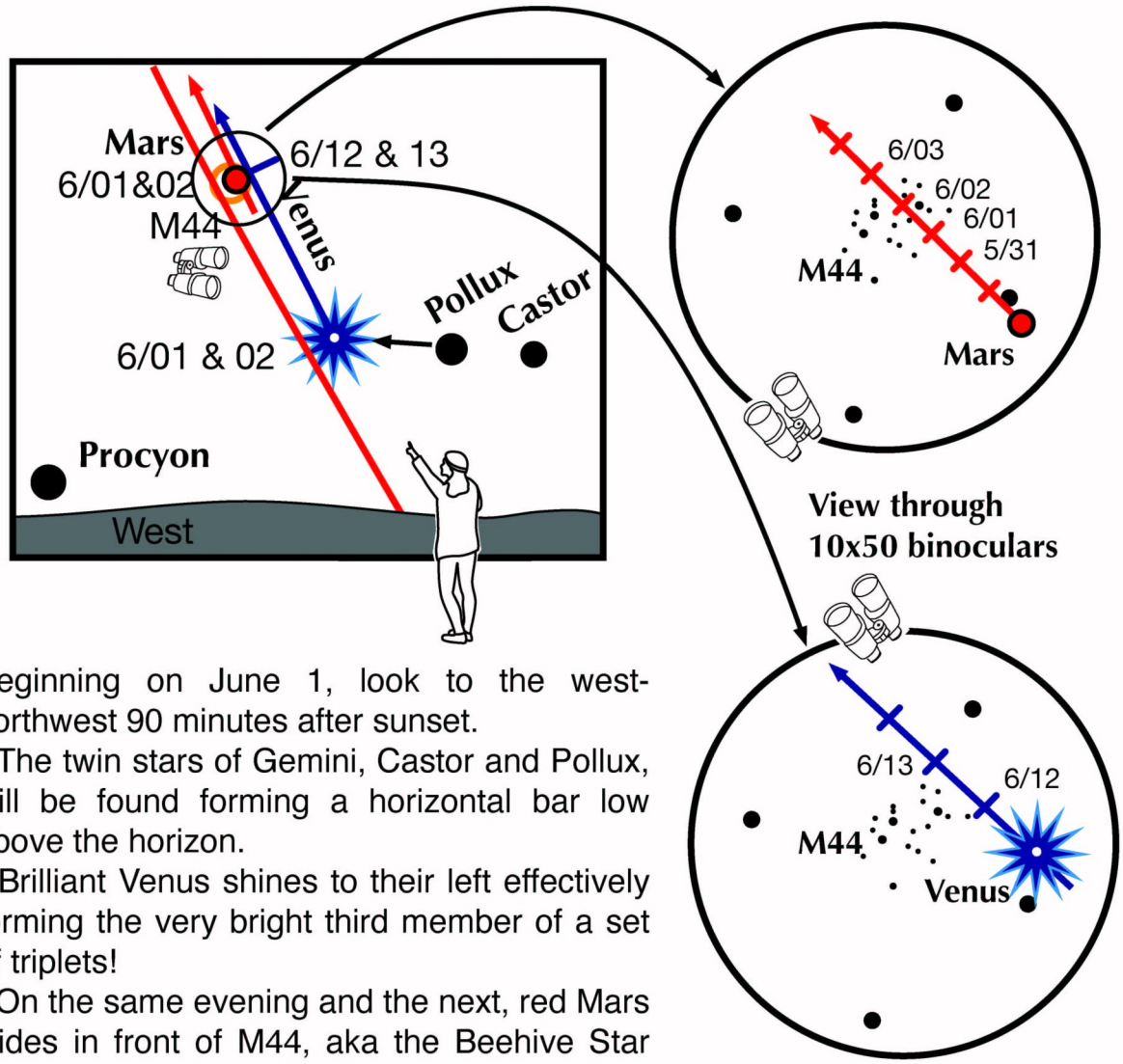
LEGEND	
1	**Ed Dixon** - Meteors from 5/6/23. Taken at Explore Park about 8:40PM with a Nikon Zfc and Rokinon 10mm f/2.8 lens riding on an iOptron Sky Guider Pro mount. Exposure of 15 seconds at ISO 400 and f/2.8. Processed and cropped with Pixinsight and Windows edit.
2	**Harry Kessler** - Here's a bit of animation just for fun. The wide FOV is of the Leo Triplet. I used my daughter's Sigma 18-300 Super Zoom at 300mm and my Canon 60D mounted on the AVX GEM. It was polar aligned but no tracking. Processed 120 x 30 sec exposures through Siril, Photoshop with plugins Astronomy Tools and DeNoiseAI. The final image of NGC 3628 was 144 x 180 sec light frames captured with my Canon 60D at prime focus on the C8 SCT mounted on the AVX and PHD2 guided. Dark and flat frames also captured. They were stacked in Sequator and processed through StarTools and Photoshop. OpenShot video editor was the secret animation sauce. Link: video
3	**Michael Martin** - Moon
4	**Michael Martin** - Moon
5	**Dave Thomas** - Photo of Sunspots on 5/6/2023. Canon 850D 300 mm zoom lens. 1/800 exposure, 100 ISO

RVAS June 12th Monthly Meeting In-Person and Zoom

Virginia Western Community College is closed on June 19th, our normal third Monday meeting date. So, the meeting has been rescheduled to Monday, June 12th. As usual, members and guests may attend in-person or via Zoom. Our informal "Celestial Café" chat session begins at 7:00 p.m., with the regular meeting to follow at 7:30 p.m. Mask wearing is optional for both in-person gatherings. The evening's featured speaker is RVAS Vice President John Wenskovitch. John's program is "An Open Cluster Tour Through the Milky Way": what they are; where they're found; their various morphologies and characteristics; and the Astronomical League's "Open Cluster Program," in which RVAS members may participate and receive recognition for observing these objects.

Our meeting place is Virginia Western Community College's Natural Science Center. It's located on the south side of Colonial Avenue, above the Community Arboretum, and is accessed via the roundabout at Winding Way. The Natural Science Center (marked "N" and circled in red) and adjacent parking (also circled in red) are indicated on the map below. Our thanks to VWCC and RVAS member Dr. Mallory White, Assistant Professor at VWCC, for the use of these facilities.

A must see celestial planetary play: Two planets visit the Beehive

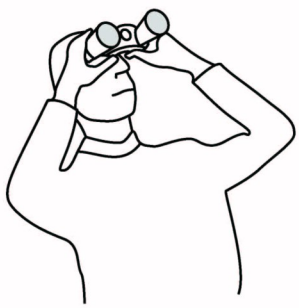


Beginning on June 1, look to the west-northwest 90 minutes after sunset.

• The twin stars of Gemini, Castor and Pollux, will be found forming a horizontal bar low above the horizon.

• Brilliant Venus shines to their left effectively forming the very bright third member of a set of triplets!

• On the same evening and the next, red Mars slides in front of M44, aka the Beehive Star cluster, positioned above Venus. Use binoculars to find Mars sitting amid the many stellar bees.

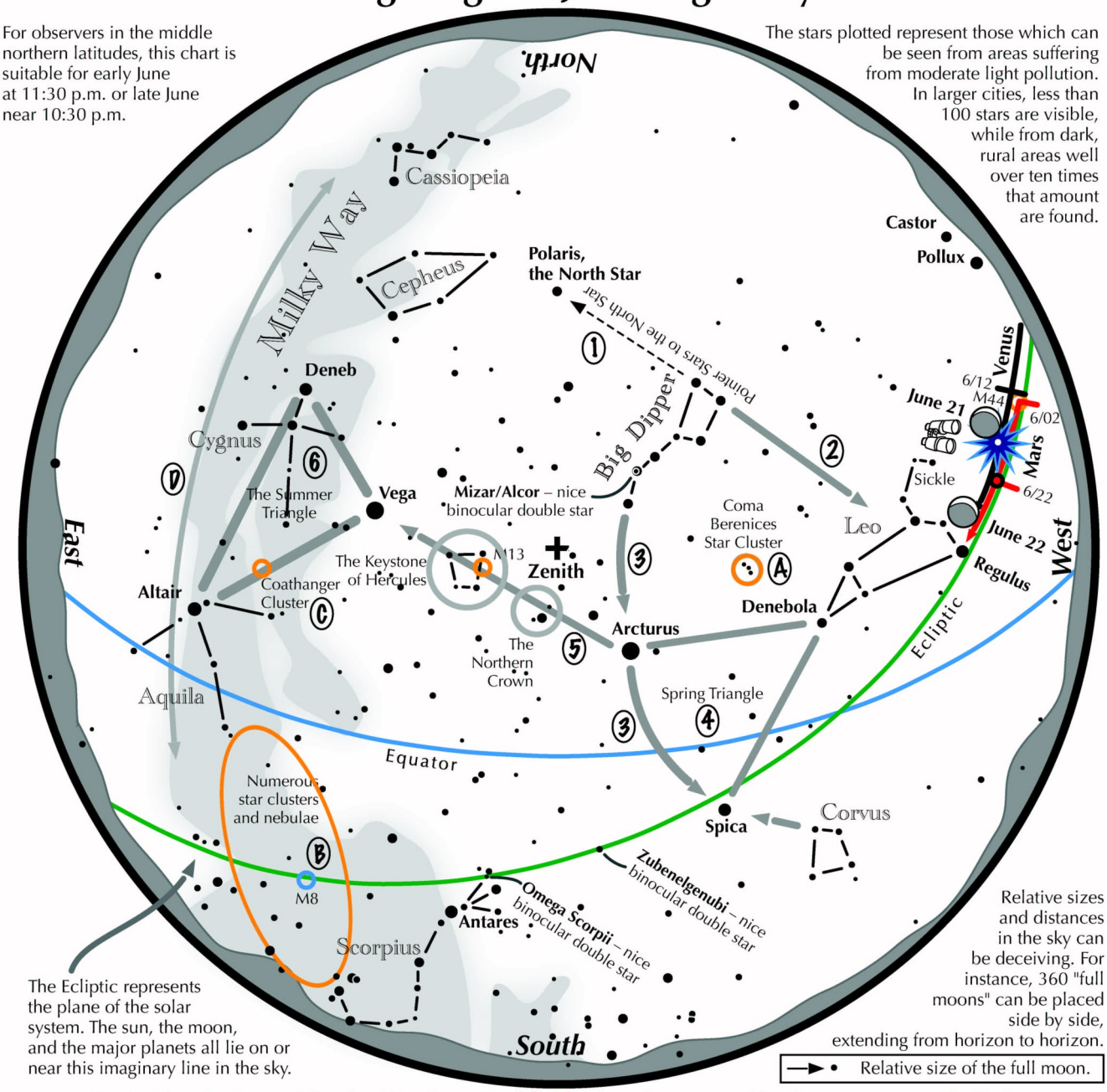


• Ten nights later, it is Venus' turn to stay at the Beehive for two consecutive nights. The planet travels along the outskirts, farther from Beehive central than Mars moved. Again, bring out the binoculars. How does the glare of brilliant Venus affect the scene?

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→• Relative size of the full moon.

Navigating the June night sky: Simply start with what you know or with what you can easily find.

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
3. Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
4. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
5. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
6. High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
D. Sweep along the Milky Way for an astounding number of faint glows and dark bays.

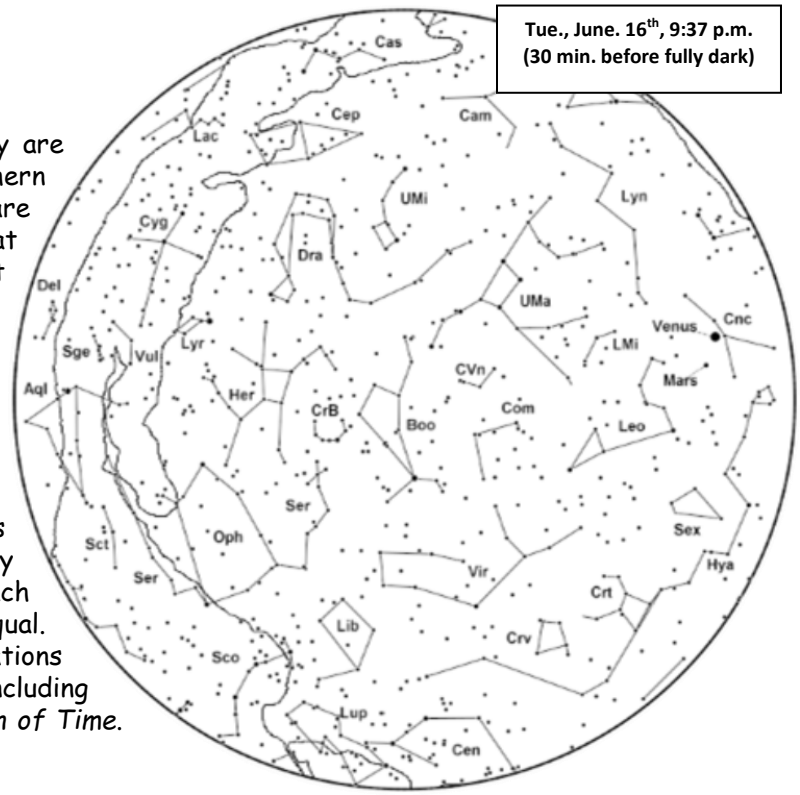
What's Up? Highlights

June 1 to 30, 2023

(Including, but not limited to, information presented at the June 15th meeting. For the entire PowerPoint, click here .)

This Month:

Most all of us with an interest in astronomy are aware that the June solstice for the Northern Hemisphere is its longest day. But there are those among us who are surprised to learn that the solstice is neither the day of the earliest sunrise nor the latest sunset. Why this is so involves some non-trivial details, but there are two fundamental factors: the Earth's orbit is slightly elliptical and our planet's rotational axis is tilted by about 23.4° off perpendicular to the plane of its orbit. Owing almost entirely to these two factors, a day measured by the return of the Sun to its highest position in the sky and the same day measured by our clocks, which average-out each day to exactly 24 hours long, are rarely equal. See below for a link to a range of explanations from a thumbnail to a rather technical one, including reference to the *analemma* and the *Equation of Time*. Enjoy!



Celestial Events:

- Fri., 2nd – View Mars nestled "within" the Beehive Cluster (M44) as dusk deepens around 9:00 pm.
- Sun., 4th – Venus at easternmost elongation; 45.4° from the Sun in the evening sky; magnitude -4.3.
- Wed., 14th – Earliest sunrise for the year, 5:57:15 am.
- Wed., 21st – Summer Solstice, 10:58 a.m. EDT. Sun directly overhead at latitude 23.44° N. Longest period of daylight for the year, 14 hrs 46 min 52 sec.
- Wed., 21st – View the Slender crescent Moon, Venus and Mars within a 6.5° diameter circle around 8:30 pm as dusk deepens.
- Wed., 28th – Latest sunset for the year, 8:45:49 pm.
  - *For a great explanation of why the earliest sunrise and latest sunset are not on the solstice, go to: https://aa.usno.navy.mil/faq/rs_solstices#tech*

Sunset and Twilight:

Sunset Range: 8:35 p.m. (June 1st) to 8:44 p.m. (June 30th)
Twilight Ends: 10:25 p.m. (June 1st) to 10:37 p.m. (June 30th)

Weekend Observing Opportunities:

(Dark of the Moon Weekends)

June 9th/10th
June 16th/17th

Moon Phases:

Sat., 3rd – Full Moon
Sat., 10th – Last Quarter
Sun., 18th – New Moon
Mon., 26th – First Quarter

This article is distributed by NASA's Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach.

Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Look Up in the Sky - It's a Bird

Theresa Summer

Bird constellations abound in the night sky, including **Cygnus**, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, **Deneb**, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. "Deneb'' is an Arabic word meaning the tail. Then travel into the triangle until you see the star **Albireo**, sometimes called the "beak star" in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

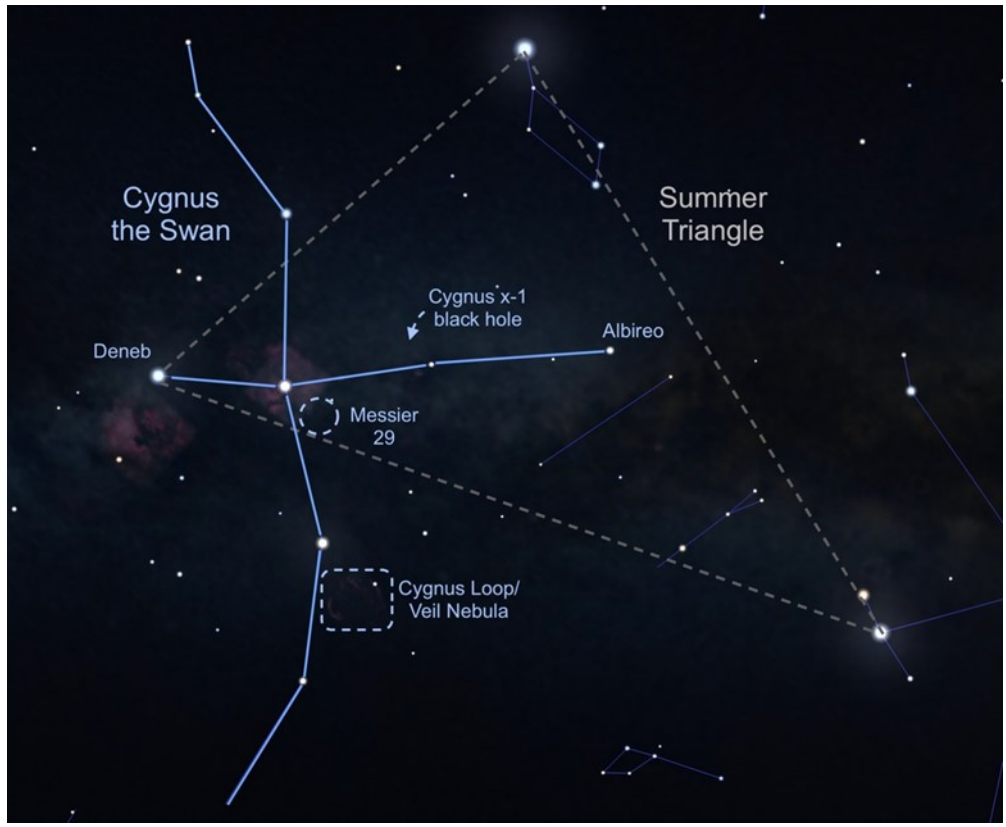
From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the **Milky Way**. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated **Messier 29**, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the **Veil Nebula**, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at www.nasa.gov/black-holes.

Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: stellarium.org



While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star.

(Credit: NASA/CXC chandra.harvard.edu/photo/2011/cygx1/)

Monthly Calendar

RVAS Monthly Meeting (NOTE DATE CHANGE): Monday, June 12th, 7:30 p.m. (Informal "Celestial Café" chat session begins at 7:00 p.m.) Natural Science Center, Virginia Western Community College, Colonial Avenue, Roanoke, VA. Open star clusters are among the most beautiful and varied objects visible in the night sky. Some, like the Pleiades, have been known since antiquity. More than 1,100 such objects have been cataloged in the Milky Way, and many more may remain to be discovered. Our evening's featured speaker is RVAS Vice President John Wenskovitch. John's program is "An Open Cluster Tour Through the Milky Way": what they are; where they're found; their various morphologies and characteristics; and the Astronomical League's "Open Cluster Program," in which RVAS members may participate and receive recognition for observing these objects. Along with John's talk will be our usual astrophotography, observing reports, "in the news" and "What's Up?" segments. John is always engaging, witty and humorous, so be sure to join us on June 12th, in person or via Zoom, for his talk and our other activities. See the map and information for the in-person meeting location elsewhere in this issue. The Zoom invitation will be issued during the week prior to the meeting.

WEEKEND OBSERVING OPPORTUNITIES: The following information on Fridays and Saturdays that may be suitable for observing is provided as a courtesy to RVAS members and other readers. The RVAS assumes no responsibility for the health and safety of anyone venturing out to stargaze, and cautions all who may do so to observe appropriate COVID-19 health and safety precautions.

Friday and Saturday, June 9th & 10th. Sunset is at 8:40 p.m. Astronomical twilight ends at 10:32 p.m. The Moon rises at 1:39 and 2:06 a.m., respectively.

Friday and Saturday, June 16th & 17th. Sunset is at 8:43 p.m. Astronomical twilight ends at 10:36 p.m. The Moon sets at 7:42 and 8:44 p.m., respectively.

Future Weekend Observing Opportunities: July 7th & 8th and 14th & 15th.

Astro-Quiz

What planet of our solar system has two moons that may be classified as ocean worlds? Name the planet and moons and the liquids forming their oceans.

Answer to Last Month's Quiz: Last month we asked which two among the 9 major annual meteor showers listed by the American Meteor Society share what parent body? The AMS's major showers include the Quadrantids; Lyrids; eta Aquarids; Southern delta Aquarids; Perseids; Orionids; Leonids; Geminids; and Ursids. As RVAS member Dan Chrisman correctly responded, the two are the eta Aquarids and the Orionids, and the parent body is Halley's Comet (1P/Halley). The dust grains shed by Halley become the eta Aquarids and the Orionids, when they interact with Earth's atmosphere. The eta Aquarids peak in early May and can be seem from both the Southern and Northern Hemispheres, but more easily from the Southern, due to the southerly declination of the radiant. They're best in the pre-dawn hours and may produce 30 meteors per hour, some of which may leave persistent trains. The Orionids peak in mid-October and can also be seen from both Hemispheres. With their radiant just north of Orion's bright star Betelgeuse, the shower only slightly favors the Northern Hemisphere. While only producing about 15 meteors per hour, they are known for their persistent trains and fireball potential. Have an answer to this month's quiz (or a future quiz question and answer to suggest)? E-mail it to astroquiz@rvasclub.org!