Snake River Skies

The Newsletter of the Magic Valley Astronomical Society — *August 2022*

Membership Meeting
Saturday Aug 13th 2022 at 7:00p at the Herrett Center - CSI Campus

Centennial Observatory
See Inside for Details

Faulkner Planetarium
See Inside for Details

www.mvastro.org

Club Officers

Gary Leavitt, President
leavittg@cableone.net

Dr. Jay Hartwell, Vice President

Jim Tubbs, Treasurer/AL-Cor
jtubbs015@msn.com
208-404-2999

David Olsen, Newsletter Editor
editor@mvastro.org

Rick Widmer, Webmaster
rick@developersdesk.com

Magic Valley Astronomical Society is a member of the Astronomical League

M-51 imaged by Rick Widmer & Ken Thomason Herrett Telescope - Shotwell Camera

President's Message

Hi Everyone:

Hope some of you were able to enjoy our annual Castle Rocks star party. Sorry I couldn't make it this year. As August is now upon us, we have several nighttime events upcoming we can all enjoy. The Perseid Meteor shower runs from July 17-August 24th, with the peak at August 12th. Unfortunately a full Moon dims the party on the 12th, but a few days prior to maximum should help. The major planets return for an all-night show. Saturn is up by 9pm local time with Jupiter, Mars and Uranus around Midnight. Our August meeting on the 13th will feature a presentation by yours truly with an update on the James Webb telescope and an introduction to the upcoming Artemis Moon missions. That's 7pm at the Herrett Center Library.

See you there!
Gary Leavitt, President MVAS

August 2022 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4	5	6
				First Qtr → Moon →  Visible 50% ↑ Age: 7.43 Days	**BSU 1st Friday Physics** see Calendar of Events	
7	8	9	10	11	12	13
					Sturgeon Moon 7:35 pm MDT  Age: 14.45 Days	**Perseid Meteor Shower 12th & 13th** see Calendar of Events
14	15	16	17	18	19	20
Saturn at opposition visible from sunset to sunrise					**Last Quarter Moon**  Visible: 47% ↓ Age: 22.43 Days	**45th Anniversary** of **Voyager 2 launch**
21	22	23	24	25	26	27
	NightSky Network webinar **Parker Solar Probe** see Calendar of Events					**New Moon**  Visible 0% Age: 0.14 Days
28	29	30	31			
	Artemis I launches for the Moon see NASA Night Sky Notes, p. 8					

TABLE of CONTENTS

Calendar of Events

Friday, Aug 5 Boise State Physics First Friday Astronomy

Prof. Katie Devine, College of Idaho, Mathematics & Physical Sciences
"The PERYSCOPE Project – Involving Astronomy Students in Star Formation Research"

In-person Lecture begins 7:30 pm (MT), in the Education Bldg, BSU campus
(2133 W Cesar Chavez Ln, Boise, 83706) OR watch online via this link:
http://boi.st/astrobroncoslive (the 'Astronomy at Boise State Physics' YouTube channel)

If you missed this presentation, you can view it and other previous lectures on the BSU Physics' YouTube channel.

Jul 1, 2022	Dr. Alejandro Soto, Southwest Research Institute, Planetary Science Directorate Dust Storms on Mars
Jun 3, 2022	Dr. Andres Salcedo, University of Arizona Weighing and Measuring the Universe with Galaxy Clusters
May 6, 2022	Dr. Christy Swann, U.S. Naval Research Laboratory From Venus to Pluto - Windblown Sand Throughout Our Solar System

Friday August 12 Perseid Meteor Shower & Stargazing program in Hailey, ID

The Perseid Meteor Shower, though peaking around the Full Moon, is still worth watching! Here are two sites with excellent write-ups. The first is EarthSky's 2022 Meteor Shower Guide, where you'll learn that these meteors may be seen within the window July 14 to September 1, and are best seen in the hour or so before dawn. The second is our good friend Brian Ventrudo's Cosmic Pursuits for August on which you'll find a nice graphic for the Perseid's radiant (where the meteors originate from in the sky).

If you live near Hailey, ID, check out the program 'Knowing the Night Sky: Our Moon & the Perseids (arrow down to see notice) on Friday, Aug 12th from 9:30-11:00pm at Croy Canyon. Astronomer Tim Frazier will give the presentation, and telescopes will be available. Please RSVP to Kristin.Fletcher@haileypubliclibrary.org.

Friday, August 12 Full Sturgeon Moon

"August's full moon is called the Sturgeon Moon after the primitive fish that used to be abundant in North America's lakes and rivers during the summer months. In China, August's moon is known as the Hungry Ghosts Moon for the Hungry Ghosts Festival, which is when the gates of the underworld open up and the hungry dead walk amongst the living. The Chinese prepare offerings of food and money to satisfy the ghosts' hunger, make them happy, and prevent them from causing havoc. In Malaysia and Singapore, folks set up musical stages and host performances, making sure to always leave the front row empty for the honored guests – hungry ghosts. Under the full moon, people light lotus-shaped water laterns and float them on lakes, rivers, and pools in order to provide light for lost souls to find their way safely back into the afterlife." Read the full story of the Full Sturgeon Moon for more information.

Monday, August 22 NASA Night Sky Network webinar – Parker Solar Probe

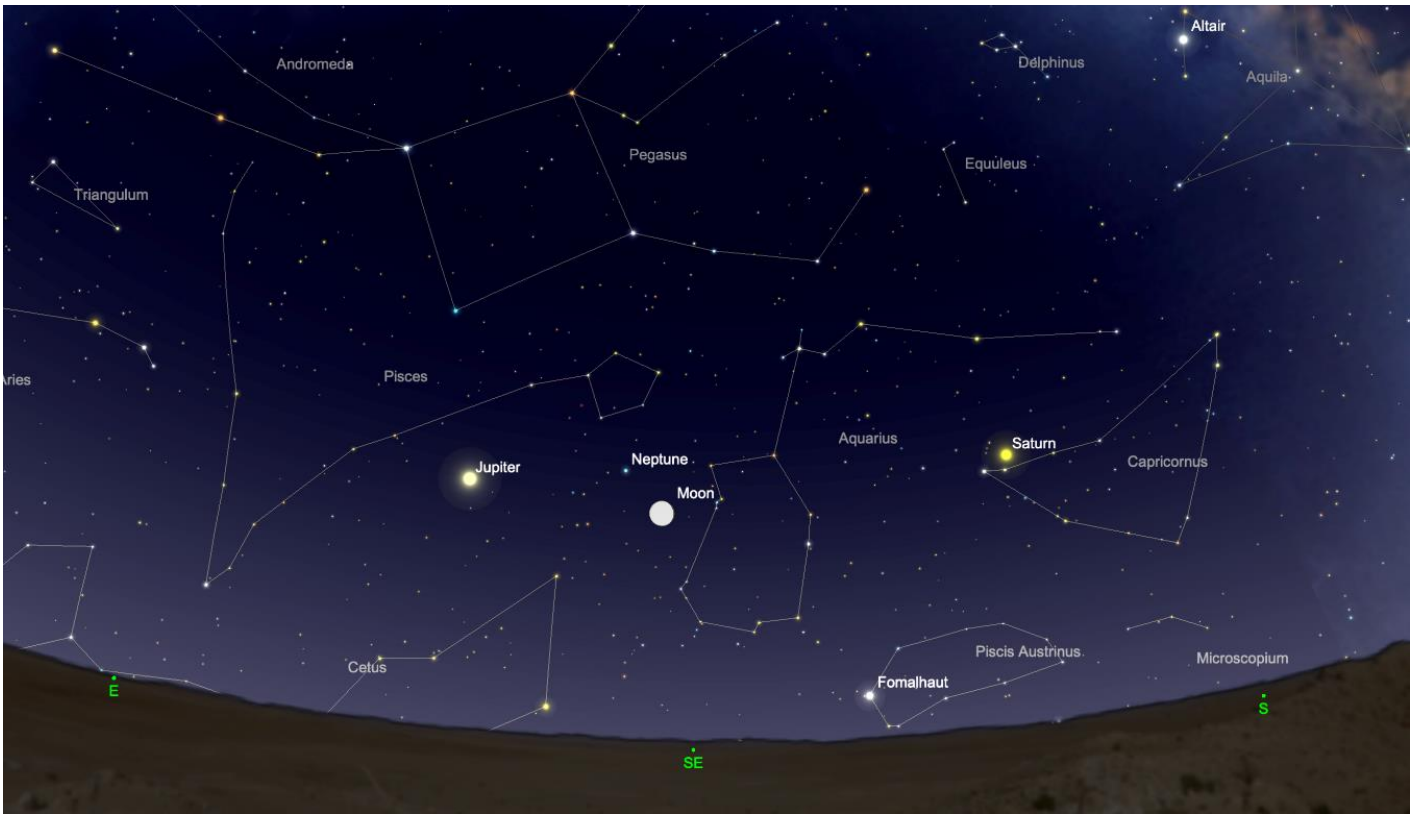
At 7:00 pm Mountain time, join Dr. Kellty Korreck, a scientist in the Heliophysics Division at NASA (link to join on YouTube), as she tells us about the Parker Solar Probe. According to the NASA accouncement:

"The Parker Solar Probe spacecraft was designed to solve three mysteries of the sun as well as the very practical goal of furthering our understanding of space weather. This talk, geared toward adult learners, formal and informal educators, and citizen scientists, will cover Parker's measurements of Coronal Mass Ejections (billions of tons of material hurtling through space at millions of miles an hour), as well as recent Venus encounters and a few other surprises that Parker has discovered!"

"Cosmic Pursuits" for August

Please read Brian Ventrudo's complete Cosmic Pursuits for August. In addition to the image below, Brian has some awesome images on the Perseid meteor shower. But wait – there's more!

He has had an article published in the print edition of *Sky & Telescope* for August 2022, "A Visit to Taurus Poniatovii", in which he describes the former constellation that's now an asterism.



"Saturn at opposition on August 14, 2022."

image produced using SkySafari 6 Plus software

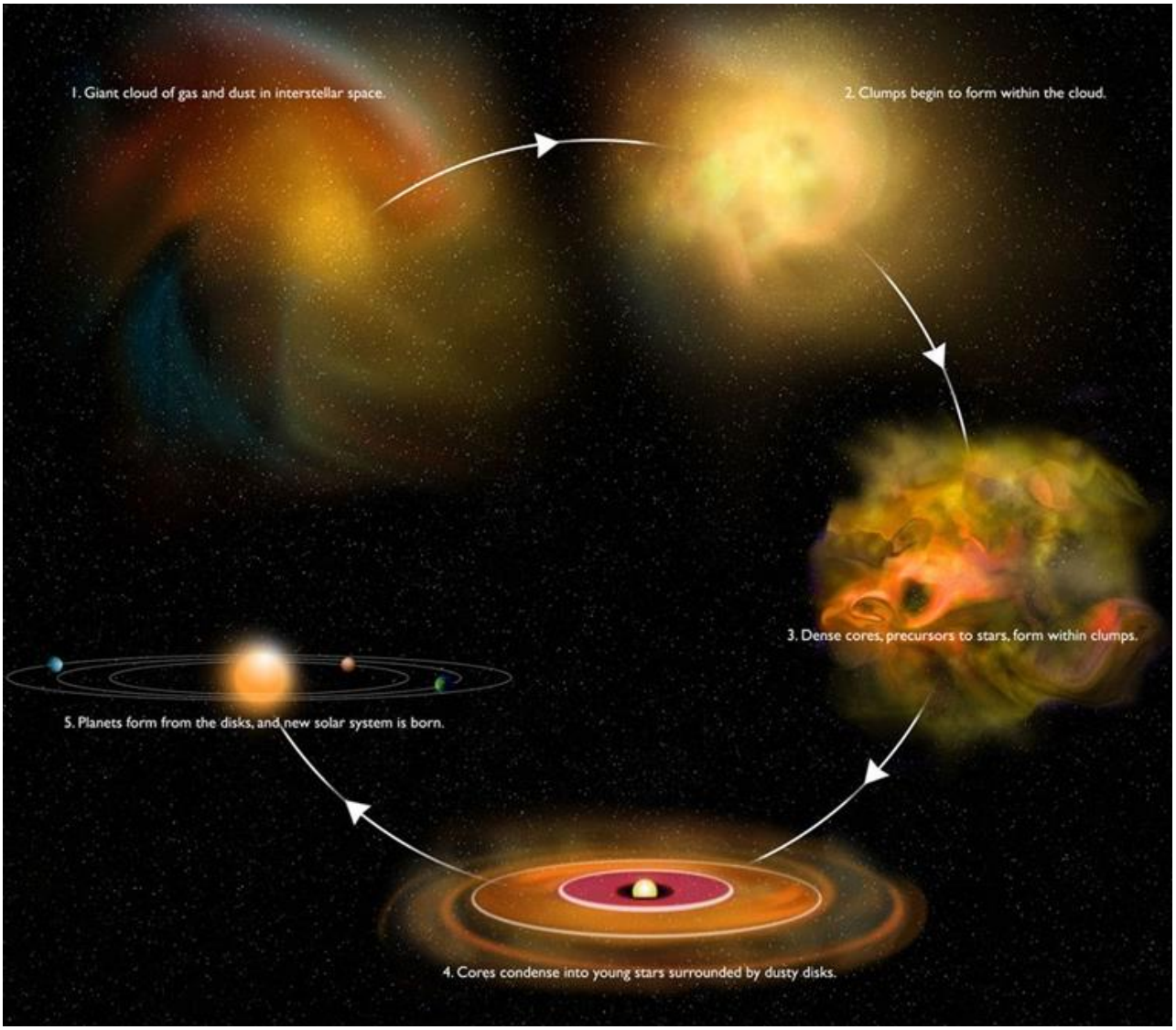
JWST and the Formation of Stars

Brian Jackson -- Boise State University, Dept. of Physics *edited by Loretta J Cannon*
bjackson@boisestate.edu -- twitter.com/decaelus -- www.astrojack.com/

Like the musical *Hamilton*, the James Webb Space Telescope (JWST) lives up to the hype. Already, astronomers have used it to discover galaxies older and more distant than ever before, and it's only getting started. The image shown (credit: NASA) is the Carina Nebula seen by Hubble (left) and JWST (right). One of the astronomical processes JWST will elucidate is the formation of stars. Understanding star formation is critical if we want to answer questions about the origin of life on Earth and the possibility for life elsewhere in the universe. But even though scientists have been thinking about star formation since before the word "scientist" existed, some of the most basic questions about the process remain unanswered.

Herschel's Heavenly Hypothesis

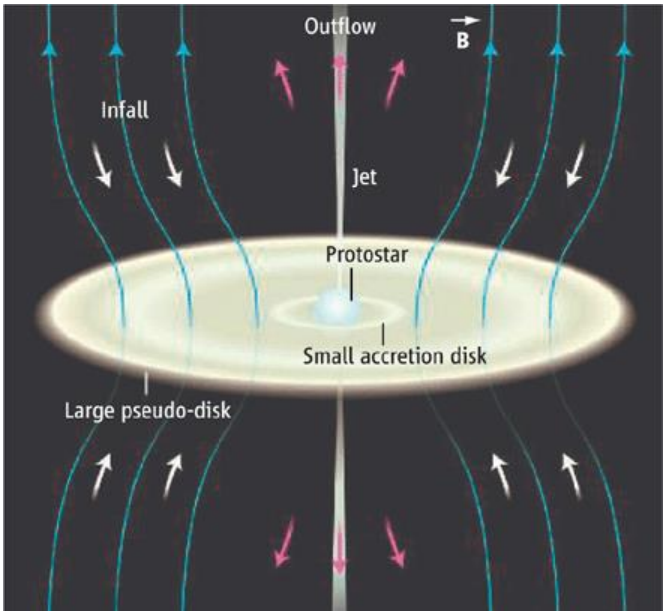
About 4.6 billion years ago, a cloud of dust and hydrogen gas collapsed under its own weight (a collapse catalyzed by a close-by cosmic catastrophe). Within the cloud's center, atom piled on atom, crushed by supersonic infall, until Heisenberg made swiss cheese of the electrostatic walls. Hydrogen was compressed into other atoms. Then, millions of years after the initial collapse, our protostar Sun began to twinkle.



The process of solar system and star formation (from Astronomy News).

The idea that stars might evolve through time runs counter to the Platonic ideal of a perfect, unchanging universe but arose, in part, from the diligent labors of William and Caroline Herschel in the mid- to late 18th century. German immigrants to England in a time before "Germany" existed, the brother-sister team conducted some of the first comprehensive astronomical surveys, motivated by William's conjectures that cycles of growth, decay, and death analogous to "vegetative" cycles operated throughout the universe. He even suggested that the nebulae seen by astronomers throughout the sky showed signs of "condensation" and "compression".

Our understanding of stellar formation and evolution, rooted in William's fertile speculations, blossomed in the early and mid-20th century, as Eddington, Einstein, and others uncovered the quantum phenomena that govern the internal combustion engines of stars. A combination of sophisticated theoretical and computational approaches in the mid- and late 20th century allowed astronomers to include even more complex phenomena into their stellar formation models, including magnetic and radiative effects that play subtle but profound roles in, for example, molding the inflows that feed nascent stars.



Model of inflows feeding a growing star (from Science.org).

The Fault in Our Stars

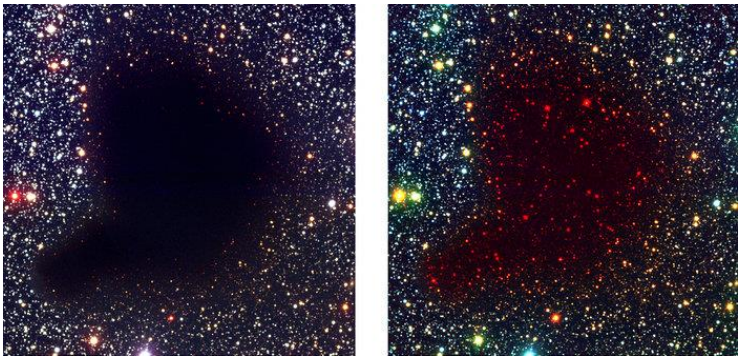
But just as knowing the chemistry of cellular respiration is not enough to understand the evolution of life on Earth, understanding basic stellar formation physics is not enough to understand the process as a whole. We need the equivalent of a fossil record to resolve long-standing mysteries of star formation, but, as with very ancient fossils, the earliest phases of star formation are not often clearly observed. One of the longest-standing mysteries remains – stars take a very long time to form.

The cosmic progenitor clouds of gas and dust seem to evolve and collapse in only a few million years; but, for as yet unknown reasons, it takes billions of years for these protostars to actually become stars. This mismatch in timescales is the equivalent of Jamacian sprinter Usain Bolt, running at 10 meters per second (20 mph), taking almost three hours to run the 100-meter dash – something must be slowing him down.

Unfortunately, the star formation slow-down processes happen where astronomers can't see them, and anyone who has ever looked at the Milky Way has seen the cause – dust. The same collapse of gas that forms the nascent star also concentrates dust, which conceals the star-forming core. As a result, astronomers have struggled to understand these obscure, early stages of star formation.

Piercing the Cosmic Veil

Enter the James Webb Space Telescope. As an infrared telescope, JWST allows astronomers to peer *through the clouds of dust* to unveil numerous cosmic mysteries. Infrared light has a longer wavelength than visible light (the kind of light we can see with our naked eyes). Consequently, where dust particles are like very tall and narrow speed bumps in the road for visible photons, they are only very fine gravel chips for infrared photons.



A comparison of a dusty region in space seen in visible light (left) and in infrared light (right) (from Eso.org).

Astronomers will use the JWST not only to learn about star formation but also to explore the origin of the universe itself, even when obscured by ubiquitous dust. Recently, astronomers announced the detection of a galaxy so old it formed only a few hundred million years after the Big Bang.

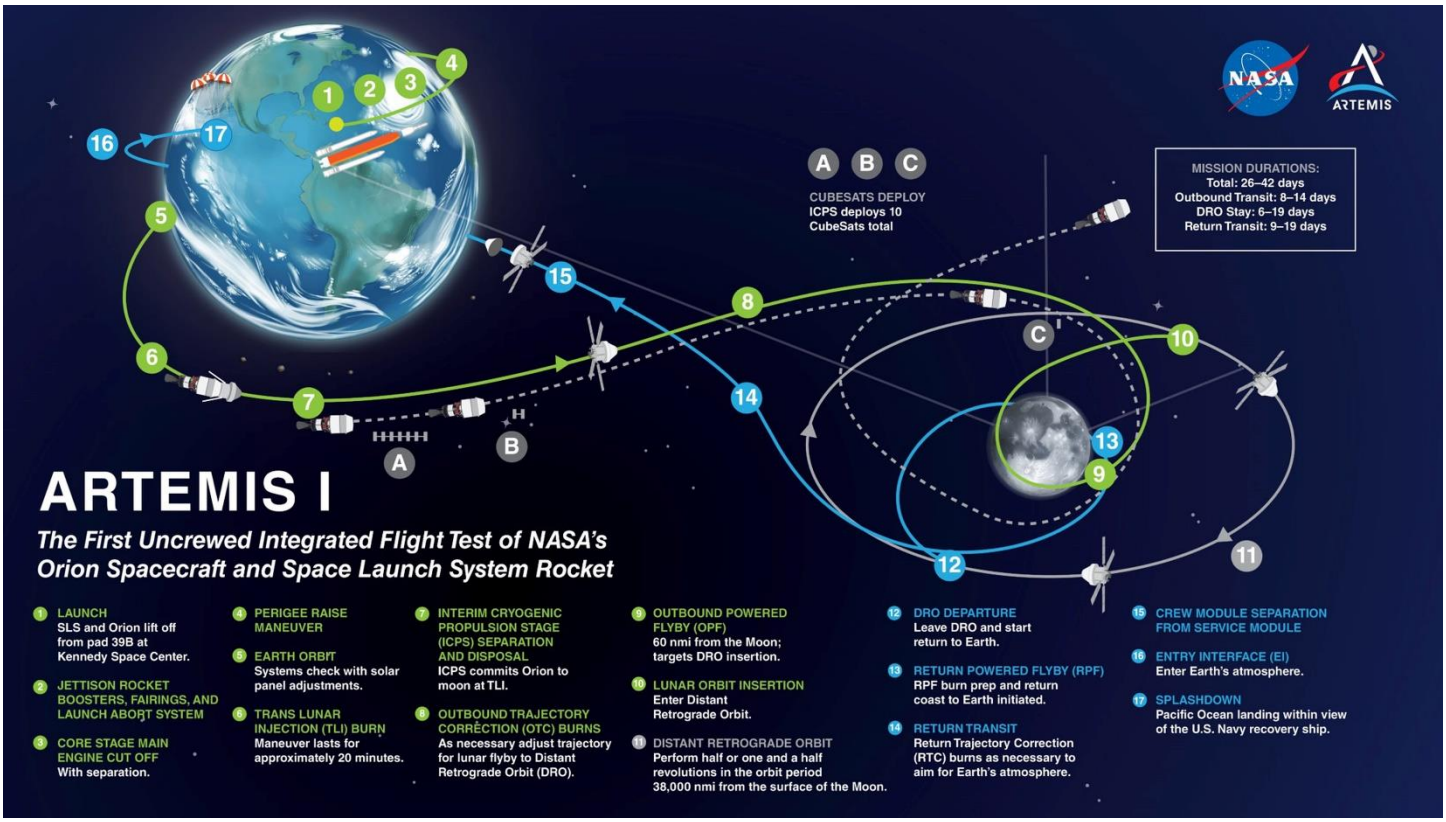
Want to learn more about star formation? Join Boise State First Friday Physics on August 5th at 7:30p MT when we host Prof. Katie Devine to talk about the PERYSCOPE Project and involving astronomy students in star formation research. The presentation will also be live-streamed at boi.st/astrobroncoslive.

Artemis 1: A Trip Around the Moon – and Back!

by David Prosper *expanded and edited by Loretta J Cannon*

We are returning to the Moon - and beyond! On Monday, August 29, NASA's Artemis 1 mission will launch the first uncrewed flight test of both the Space Launch System (SLS) and the Orion spacecraft on a multi-week journey. Later in this article will be information on Joining NASA for a Launch Party. Orion will travel thousands of miles beyond the Moon, briefly entering a retrograde lunar orbit before heading back to a splashdown on Earth. Follow the latest news and updates on Artemis 1 and our return to the Moon at nasa.gov/artemis-1.

A larger version of the infographic below is available from NASA at nasa.gov/image-feature/artemis-i-map



The massive rocket will take off from Launch Complex 39B at the Kennedy Space Center in Florida (**click image** LEFT for **youtube video,** from this NASA story). The location's technical capabilities, along with its storied history, mark it as a perfect spot to launch our return to the Moon. The complex's first mission was Apollo 10 in 1968, which appropriately also served as a test for a heavy-lift launch vehicle (the Saturn V rocket) and lunar spacecraft – the Apollo Command and Service Modules joined with the Lunar Module. The Apollo 10 mission profile included testing the Lunar Module while in orbit around the Moon before returning to the Earth. In its "Block-1" configuration, Artemis 1's SLS rocket will take off with 8.8 million pounds of maximum thrust, even greater than the 7.6 millions pounds of thrust generated by the legendary Saturn V, making the SLS the most powerful rocket in the world!

Artemis 1 will serve not only as a test of both the SLS rocket and Orion hardware, but also as a test of the integration of ground systems and support personnel that will ensure the success of this and future Artemis missions. While uncrewed, Artemis-1 will still have passengers of a sort: two human torso models designed to test radiation levels during the mission, and "Commander Moonikin Campos," a mannequin named by the public. The specialized mannequin will also monitor

radiation levels, along with vibration and acceleration data from inside its mission uniform – the Orion Crew Survival Suit, the spacesuit that future Artemis astronauts will wear. The "Moonikin" is named after Arturo Campos, a NASA electrical engineer who played an essential role in bringing Apollo 13's crew back to Earth after the near-fatal disaster in space.

The mission also contains other valuable cargo for its journey around the Moon and back, including CubeSats, several space science badges from the Girl Scouts, and microchips etched with 30,000 names of workers who made the Artemis-1 mission possible. A total of 10 CubeSats will be deployed from the Orion Stage Adapter, the ring that connects the Orion spacecraft to the SLS, at several points along the mission's path to the Moon. The power of SLS allows engineers to attach many secondary "ride-along" mission hardware like these CubeSats, whose various missions will study plasma propulsion, radiation effects on micro-organisms, solar sails, Earth's radiation environment, space weather, and of course, missions to study the Moon and even the Orion spacecraft and its Interim Cryogenic Propulsion Stage (ICPS)!

Click image LEFT for another **youtube video** describing the mission: "In the next nine and a half minutes, you'll experience a twenty-five-and-a-half-day mission from roll-out to recovery of the first integrated flight test of NASA's Orion spacecraft and the Space Launch System rocket, launching from the agency's Kennedy Space Center in Florida. This uncrewed mission will be the first in a planned series of Artemis missions beyond the Moon, signaling what astronauts who dare to operate in deep space will experience on future flights." From NASA's Experience Artemis 1 site.

As with all NASA missions, they produce a wealth of information for distribution. Here are the Media Resources for the Artemis 1 mission. In addition to these resources, they have prepared some fun and informative infographics. At RIGHT is one for the Space Launch System (Credit: NASA image/Kevin O'Brien), and more SLS graphics can be found here. Explore the full nasa.gov/artemis-1 site for so much more.

HOST A NASA ARTEMIS 1 WATCH PARTY

Join NASA for the Launch! Gather friends, family and schoolmates on Monday, August 29, to watch Artemis 1 launch at 8:33am EDT (5:33 am MDT). Registration for this online event is FREE and . . .

> "will provide communications about launch schedule changes, information about launch related activities, and access to curated launch resources."

There's also a link on this site to

> "Get your ARTEMIS Virtual Launch Passport! Print, fold, and get ready to fill your virtual launch passport. Stamps will be emailed following launch to all registrants."

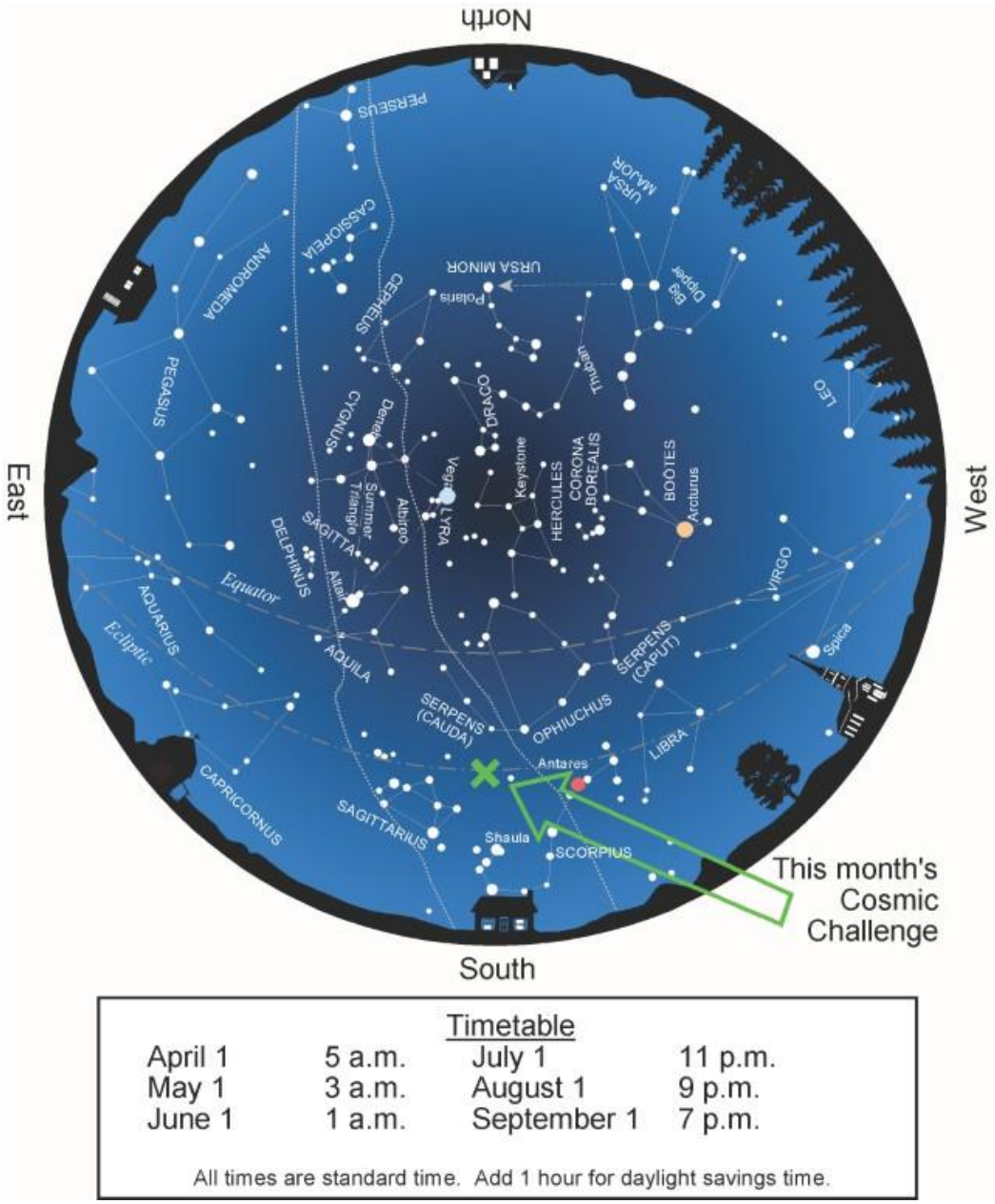
If you want to explore more of the science and stories behind both our Moon and our history of lunar exploration, the Night Sky Network's **Apollo 11 at 50 Toolkit** covers a ton of regolith: bit.ly/nsnmoon! NASA also works with people and organizations around the world coordinating **International Observe the Moon Night**, with 2022's edition scheduled for Saturday, October 1, moon.nasa.gov/observe.

Great Dark Horse Nebula

	naked eye

Target	Type	RA	DEC	Constellation	Magnitude	Size
Dark Horse Nebula	Dark nebula	17h 10m	-27°	Sagittarius	---	~480'

Last month's challenge, to visually spot Abell Galaxy Cluster 2065, could have been subtitled "Go Big or Go Home." That challenge was tough in even that largest amateur telescopes. The good news is that this month's challenge turns the tables. All you need are your eyes. And decent skies.

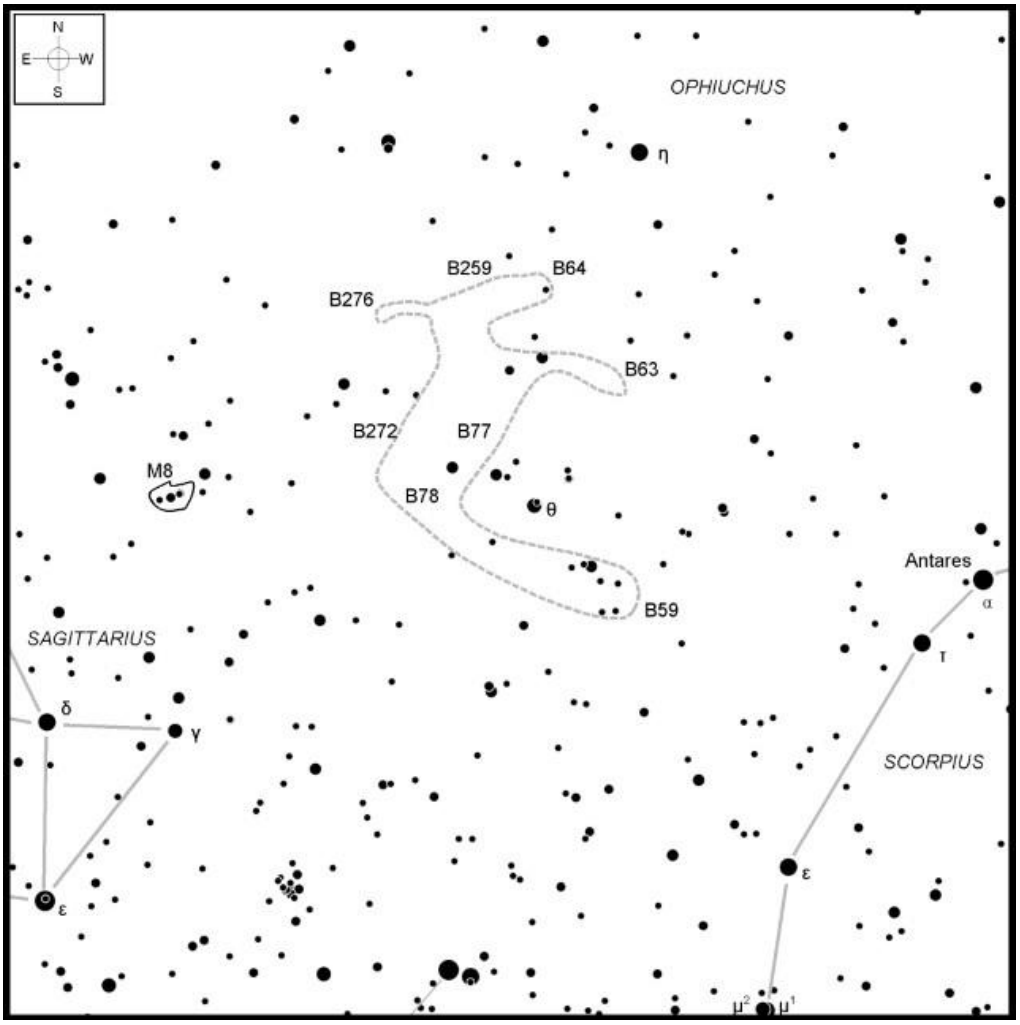


August evening star map, adapted from Star Watch by Phil Harrington

One of the dead giveaways that the Milky Way is a spiral galaxy is the preponderance of dark nebulae that litter the plane of the galaxy. The summer Milky Way, stretching from Cygnus southward to Sagittarius, is especially polluted with clouds of opaque cosmic dust. One of the most obvious patches of dark nebulosity, the Great Rift, begins just south of Deneb in Cygnus and flows southward along the lane of our galaxy, through Aquila, to end about 120° later Scutum. Photographs display the ghostly outlines of many dark nebulae prominently against the bright backdrop of more distant stars. But as is often the case, when we look their way by eye, whether aided by telescope, binoculars, or eye alone, they are nowhere to be seen.

It is this subtlety that probably explains why so many classic observers from the golden age of visual astronomy made little mention of them. Messier and the Herschels paid scant attention to dark nebulae. After all, why look at something that can't be seen when there is so much out there that *can* be seen?

Finder chart for this month's Cosmic Challenge, adapted from Cosmic Challenge by Phil Harrington
Click on the chart to open a printable PDF version in a new window



It wasn't until long after the marriage between photography and astronomy that the study of dark nebulae came into its own. Four years after Barnard's death, his collection of photographs was published as A Photographic Atlas of Selected Regions of the Milky Way after his research had been completed by Edwin Frost, then director of Yerkes Observatory, and Mary Calvert. In additional to the extraordinary photos, Barnard also included regional maps that assigned catalog numbers to each individual opaque cloud.

Many of Barnard's dark nebulae remain a supreme test for visual observers. To spot them, however, we have to change our way of thinking. In these cases, it's what you *don't* see that counts.

Besides the Great Rift, one of the largest and darkest dark nebulae in the summer sky lies midway between the Small Sagittarius Star Cloud (M24) and brilliant Antares in Scorpius. The nebula is so large that Barnard assigned it five separate entries in his catalog. By eye, we see them collectively as the Pipe Nebula. The Pipe Nebula extends over 7° in southern Ophiuchus. From a dark-sky site, its smoking-pipe shape stands out prominently against the star-studded backdrop. The "bowl" of the pipe, designated Barnard 78, looks roughly rectangular to the eye, while its stem, formed from Barnard 59, 65, 66, and 67, extends more than a degree to the west-southwest.

That's only part of this challenge. The Pipe Nebula is actually quite obvious when viewed under naked-eye limiting magnitude 6.0 or better skies, but by adding other, more subtle Barnard patches that float to the Pipe's northwest, the area transforms into the profile of a horse. In fact, the horse even seems to be strutting or prancing, as you might see in a circus act.

The first person to publicize the idea of the Dark Horse was author Richard Berry, former editor of *Astronomy* magazine. Recounting his "discovery," Berry recalls:

> *"After I graduated from college, I got into astrophotography, and became especially fascinated with Milky Way. I started taking wide-angle pictures, eventually with large-format cameras. About the same time, I found a copy of Barnard's atlas at a university library, and it really inspired me. You can't shoot wide, deep images of the Sagittarius-Scorpius-*

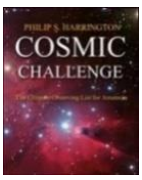
Ophiuchus region without picking up the dark nebulae. Going back to my photos, sitting right there in plain sight was a huge dark horse against the star clouds! Barnard called part of it the Pipe Nebula because he was shooting relatively narrow angle views. Some years later, when I ran readers' images of the same region in Astronomy, I started mentioning the 'Great Dark Horse Nebula' in a few of the captions. The name (or at least the Horse) seems to have caught on."

The Pipe is unmistakable given a good sky, but the Horse takes a good eye and an even better imagination. Can you spot it? The photo RIGHT shows the horse standing on end, while the finder chart above identifies which clouds are which. Barnard 259 make up the horse's nose, Barnard 268 forms its mane, while a thin vein of darkness extending toward Barnard 276 completes the horse's head. Crescent-shaped Barnard 63 marks its bent front leg, while the remainder of the horse's torso is created by Barnard 67a, 72, 75, 261, 262, 266, 269, and 396. The horse's hindquarters are formed from the Pipe Nebula, with the bowl of the pipe as the horse's hip and the stem serving as its rear leg.

RIGHT: The Great Dark Horse appears to be pulling the center of our Milky Way above the Westport, CT Astronomical Society's 25-inch Obsession in this image taken by Michael Southam during the 2016 Stellafane convention. Visit his Astrobin album to be see more of his great images

Good luck with this month's challenge! And be sure to post your results in this column's discussion forum.

Remember that half of the fun is the thrill of the chase. Game on!



About the Author: Phil Harrington writes the monthly *Binocular Universe* column in *Astronomy* magazine and is the author of 9 books on astronomy, including Cosmic Challenge: The Ultimate Observing List for Amateurs.
Visit his website at www.philharrington.net to learn more.

Edited & formatted by Loretta J Cannon, Science Writer-Editor.

Dave Mitsky's Celestial Calendar

All times, unless otherwise noted, are UT (subtract 7 hours and, when appropriate, 1 calendar day for MDT)

8/1 Mars is 1.4 degrees south of Uranus at 9:00
8/2 Venus is at the ascending node today
8/4 Mercury is 0.7 degrees north of the first-magnitude star Regulus (Alpha Leonis) at 5:00; the Lunar X, also known as the Werner or Purbach Cross, an X-shaped clair-obscur illumination effect involving various ridges and crater rims located between the craters La Caille, Blanchinus, and Purbach, is predicted to be visible at 19:53
8/5 First Quarter Moon occurs at 11:07
8/9 A double Galilean shadow transit begins at 1:30
8/10 The Moon is at perigee, subtending 33' 13" from a distance of 359,830 kilometers (223,587 miles), at 17:09
8/12 Full Moon (known as the Fruit, Grain, Green Corn, or Sturgeon Moon) occurs at 1:36; the Moon is 4 degrees south of Saturn at 4:00
8/13 Mercury is at the descending node today; the peak of the Perseid meteor shower (a zenithal hourly rate of 100 or more per hour) is predicted to occur at 1:00
8/14 The Moon is 3 degrees south of Neptune at 10:00; Saturn (magnitude +0.3, 18.8") is at opposition at 17:00
8/15 The Moon is 1.9 degrees south of Jupiter at 10:00
8/16 A double Galilean shadow transit begins at 3:59
8/18 The Moon is 0.6 degrees south of Uranus, with an occultation taking place in Iceland, Greenland, Canada, the northern portion of the contiguous United States, Alaska, most of Hawaii, and Micronesia, at 15:00
8/19 Last Quarter Moon occurs at 4:36; the Moon is 3 degrees north of Mars at 12:00
8/20 The Curtiss Cross, an X-shaped clair-obscur illumination effect located between the craters Parry and Gambart, is predicted to be visible at 18:57
8/22 Asteroid 4 Vesta (magnitude +6.0) is at opposition in Aquarius at 19:00; the Moon is at apogee, subtending 29' 28" at a distance of 405,417 kilometers (251,915 miles) at 21:52
8/23 Mercury is at aphelion today
8/24 Uranus is stationary at 15:00
8/25 The Moon is 0.7 degrees south of the dwarf planet/asteroid 1 Ceres, with an occultation taking place in southernmost South America and most of southern and eastern Polynesia, at 19:00; the Moon is 4 degrees north of Venus at 21:00
8/27 New Moon (lunation 1233) occurs at 8:17; Mercury is at greatest eastern elongation (27 degrees) at 16:00

Happy Birthdays in August

I looked these up for you. I encourage you to 'google' these folks for their contributions to Astronomy. *-your Editor*

Aug 1st	Maria Mitchell (1818-1889)	Aug 1st	Helen Sawyer Hogg (1905-1993)
Aug 7th	John C Mather (1946-now)	Aug 12th	Otto Struve (1897-1963)
Aug 12th	Margaret Burbidge (1919-now)	Aug 16th	Pierre François André Méchain (1744-1804)
Aug 19th	John Flamsteed (1646-1719)	Aug 20th	Christian Mayer (1719-1783)

On this date in history . . .

Aug 1, 1729: Nicolas Sarabat discovered Comet C/1729 P1 (Sarabat).

Aug 1, 1786: Caroline Herschel discovered Comet C/1786 P1 (Herschel).

Aug 5, 1835: Dominique Dumouchel was the first person to observe the return of Comet 1P/Halley.

Aug 11, 1877: Asaph Hall discovered Deimos, a moon of Mars.

Aug 13, 1847: John Russell Hind discovered asteroid 7 Iris.

Aug 13, 2002: The Jovian satellite 2002 Laomedeia was discovered by Matthew Holman.

Aug 17, 1877: Asaph Hall discovered Phobos, a moon of Mars.

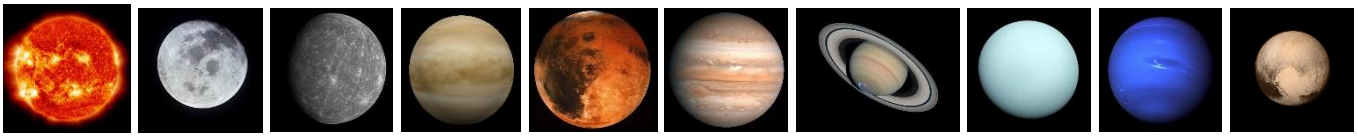
Aug 20, 1885: The first extragalactic supernova, S Andromedae, was discovered by Ernst Hartwig.

Aug 24, 1638: The gibbous phase of Mars was first observed by Francesco Fontana.

Aug 26, 1665: Abraham Ihle discovered the globular cluster M22.

Aug 28, 1789: The Saturnian satellite Enceladus was discovered by William Herschel.

Aug 30, 1992: David Jewitt and Jane Luu discovered the trans-Neptunian object (15760) 1992 QB1.



The Sun, the Moon, & the Planets

DETAILS for the Sun, Moon & Planets are *missing* from Dave Mitskey's August 2022 Celestial Calendar

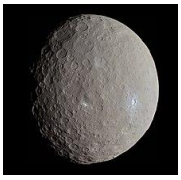
This month **Mercury** is located in the west during the evening. At midnight, **Mars, Jupiter, and Uranus** can be found in the east, **Saturn** in the south, and **Neptune** in the southeast. **Venus** is in the east, **Mars and Uranus** are in the southeast, **Jupiter** is in the south, and **Saturn and Neptune** are in the southwest in the morning sky.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the planets and Pluto are also *missing* for August.

For more on the planets and how to locate them, browse Naked Planets.

Information on passes of the ISS, the USAF's X-37B, the HST, Starlink, and other satellites can be found at Heavens Above.

Comet C/2017 K2 (PanSTARRS) departs Ophiuchus and heads southwestward into Scorpius during August. It passes about 2.5 degrees northwest of the eighth-magnitude globular cluster M107 in Ophiuchus on August 2nd and approximately four degrees west of the seventh-magnitude globular cluster M80 in Scorpius as August ends.



Asteroid **4 Vesta** shines at sixth magnitude as it travels southwestward through Aquarius this month, passing less than two degrees north of NGC 7293 (the Helix Nebula) on the nights of August 14th-16th. It reaches opposition on August 22th. A finder chart can be found on page 49 of the August issue of Sky & Telescope. The main-belt asteroid **704 Interamnia** travels slightly northwestward through Pegasus and Equuleus. It shines at magnitude +10.2 at opposition on August 18th. Asteroid **198 Apella** achieves a brightness of magnitude +10.6 when it comes to opposition in Aquarius on August 5th. For information on asteroid occultations taking place this month, see http://www.asteroido.../2022_08_si.htm.

The peak of the **Perseid meteor shower** takes place on the night of August 12th/August 13th but is severely compromised by moonlight. The periodic comet 109P/Swift-Tuttle is the source of Perseid meteors. The shower's radiant lies just to the southeast of the Double Cluster (NGC 869 and NGC 884). For more on this year's Perseids, see page 50 of the August 2022 issue of Sky & Telescope or click on https://earthsky.org...meteor-shower/.

Sixty binary and multiple stars for August: 5 Aquilae, Struve 2404, 11 Aquilae, Struve 2426, 15 Aquilae, Struve 2449, 23 Aquilae, Struve 2532, Pi Aquilae, 57 Aquilae (Aquila); Beta Cygni (Albireo), 16 Cygni, Delta Cygni, 17 Cygni (Cygnus); 41 & 40 Draconis, 39 Draconis, Struve 2348, Sigma Draconis, Struve 2573, Epsilon Draconis (Draco); 95 Herculis, 100 Herculis, Struve 2289, Struve 2411 (Hercules); Struve 2349, Struve 2372, Epsilon-1 & Epsilon-2 Lyrae (the Double-Double), Zeta-2 Lyrae, Beta Lyrae, Otto Struve 525, Struve 2470 & Struve 2474 (the Other Double-Double) (Lyra); 67 Ophiuchi, 69 Ophiuchi, 70 Ophiuchi, Struve 2276, 74 Ophiuchi (Ophiuchus); Mu Sagittarii, Eta Sagittarii, 21 Sagittarii, Zeta Sagittarii, H N 119, 52 Sagittarii, 54 Sagittarii (Sagittarius); Struve 2306, Delta Scuti, Struve 2373 (Scutum); Struve 2296, Struve 2303, 59 Serpentis, Theta Serpentis (Serpens Cauda); Struve 2445, Struve 2455, Struve 2457, 4 Vupeculae, Struve 2521, Struve 2523, Struve 2540, Struve 2586, Otto Struve 388, Struve 2599 (Vulpecula)

Notable **carbon star** for August: V Aquilae

Eighty deep-sky objects for August: B139, B142, B143, NGC 6709, NGC 6738, NGC 6741, NGC 6751, NGC 6755, NGC 6772, NGC 6778, NGC 6781, NGC 6804, PK64+5.1 (Aquila); NGC 6819, NGC 6826, NGC 6834, (Cygnus); NGC 6643, NGC 6742 (Draco); DoDz 9 (Hercules); M56, M57, NGC 6703, NGC 6791, Ste1 (Lyra); NGC 6572, NGC 6633 (Ophiuchus); H20, M71 (Sagitta); B86, B87, B90, B92, B93, M8, M17, M18, M20, M21, M22, M23, M24, M25, M28, M54, M55, M69, M70, M75, NGC 6520, NGC 6544, NGC 6546, NGC 6553, NGC 6565, NGC 6603, NGC 6818, NGC 6822 (Sagittarius); IC 4703, IC 4756, M16, NGC 6604 (Serpens Cauda); B100, B101, B103, B104, B110, B111, B113, Bas 1, IC 1295, M11, M26, NGC 6649, NGC 6712 (Scutum); Cr 399 (asterism), M27, NGC 6802, NGC 6823, NGC 6834, NGC 6940, St 1 (Vulpecula)

Top ten binocular deep-sky objects for August: Cr 399, IC 4756, M8, M11, M17, M22, M24, M25, M27, NGC 6633 (IC 4756 and NGC 6633 are collectively known as the Binocular Double Cluster)

Top ten deep-sky objects for August: M8, M11, M16, M17, M20, M22, M24, M27, M55, M57

Challenge deep-sky object for August: Abell 53 (Aquila)

The objects listed above are located between 18:00 and 20:00 hours of right ascension.

Please access the Cloudy Nights site for many more details from Dave Mitsky.
https://www.cloudynights.com/topic/835743-august-2022-celestial-calendar/

Author Phil Harrington offers an excellent freeware planetarium program for binocular observers known as TUBA (Touring the Universe through Binoculars Atlas) at http://www.philharrington.net/tuba.htm

Free star charts for the month can be downloaded at http://www.skymaps.com/downloads.html
and https://www.telescop...thly-Star-Chart and http://whatsouttonight.com/

~~~~~~

Last Word

by Boise Astro Society Newsletter Editor, Loretta J Cannon

The Sky & Telescope site for August has excellent, well-written articles. On the main page you'll find "This Week's Sky at a Glance" and the Sky Tour podcast for August, "Saturn and the Perseids". A monthly feature article by Bob King also covers the meteors: Perseids are Coming, Full Moon or Not. In this article, you will learn not only about the Perseids but also how they compare to all other meteor showers.

SCHOLARSHIP OPPORTUNITY

Are you an undergraduate interested in Astrobiology and the search for life beyond Earth? Do you currently have an internship with SETI or an Astrobiology scientist? Then you are elibigle to apply for the SETI Forward award. Accoring to their website

> "This award was established in 2018 to support undergraduate students interested in careers in SETI and astrobiology. Each year, dozens of students intern with SETI and astrobiology scientists, but most pivot to other fields, resulting in fewer talented researchers focused on the search for life beyond Earth. SETI Forward aims to bridge the gap between these internships and jobs in SETI and astrobiology research by providing $1500 per award."

The application deadline for 2022 is Monday, September 5.
If you're not currently eligible, but have an interest in astrobiology, please consider an internship with SETI or find an Astrobiology scientist with whom to intern.
~~~~~~

DEEP SPACE NETWORK

There's a new spacecraft for the Deep Space Network to manage. Last month, on August 4th, the (South) Korea Aerospace Research Institute launched their first lunar mission – Korea Pathfinder Lunar Orbiter (KPLO). It's objectives are "to develop indigenous lunar exploration technologies, demonstrate a 'space internet,' and conduct scientific investigations of the lunar environment, topography, and resources, as well as identify potential landing sites for future misisons." You can watch for it on the Deep Space Network Now site. As I write, Madrid is chatting with *Juno* and JWST.

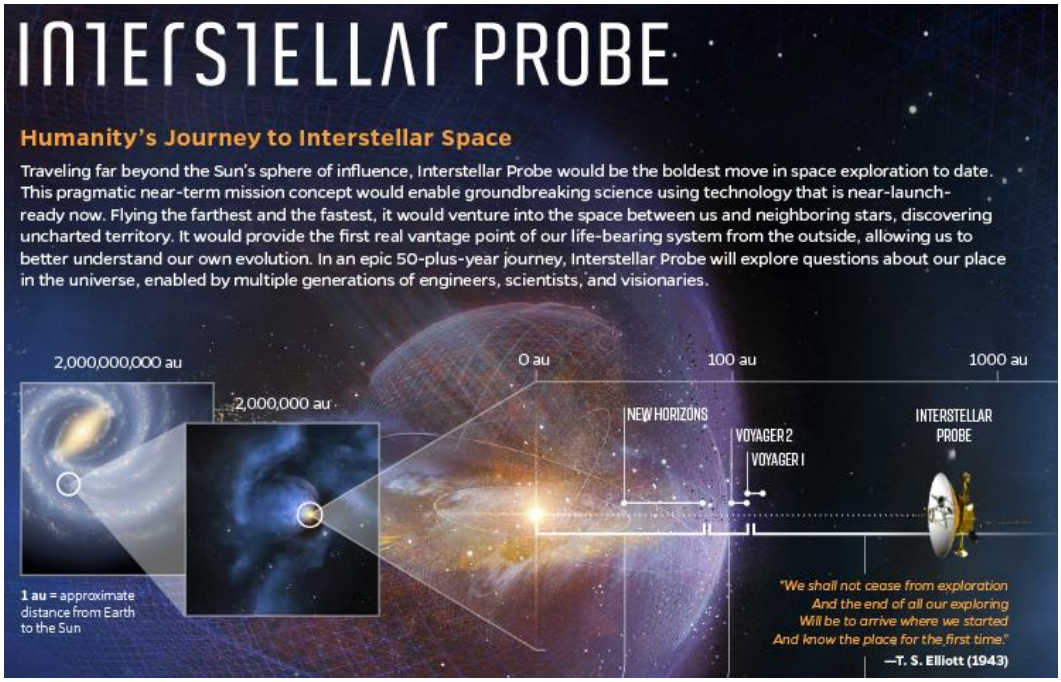
2022 NASA Goddard SUMMER FILM FESTIVAL

If you have an hour to spare and enjoy visual learning that's also fun, then make a bowl of popcorn, get cozy on your favorite chair or couch, and watch the 2022 NASA Goddard Summer film festival, which premiered July 27th on YouTube. It starts with brief snippets from among the collected short films, and then starts at minute 1:00 with a film on OSIRIS-REx and the hazardous asteroid Bennu. You can read about all 17 of the films on the Festival website, according to which:

> "See highlights of Goddard's achievements over the past year in astrophysics, Earth science, heliophysics and planetary science. [This] includes missions such as the James Webb Space Telescope, OSIRIS-REx, Landsat 9, Hubble Space Telescope, Parker Solar Probe, Fermi, ICESat-2, Lunar Reconnaissance Orbiter, Lucy and much more."

VOYAGER'S DESCENDANTS

To date, the only spacecraft that have flown into (what we understand is) instellar space are the two *Voyager* craft. And we still communicate with them every day. But something new is in the works. In the 29 July 2022 issue of *Science* is a feature article about propsed new missions to interstellar space. While I have a membership in AAAS (Amer Assn for the Advancement of Science) and can download a pdf of this article, I cannot reproduce it here in the newsletter. But if you'd really like to read it, let me know (BASNews<a>gmail). In the meantime, you can read about this on the Interstellar Probe site →, which is part of Johns Hopkins University's Applied Physics Laboratory.



The End

About the Magic Valley Astronomical Society

Magic Valley Astronomical Society
550 Sparks St.
Twin Falls, ID

The Magic Valley Astronomical Society (MVAS) was founded in 1976. The Society is a non-profit [501(c) 3] educational and scientific organization dedicated to bringing together people with an interest in astronomy.

In partnership with the Centennial Observatory, Herrett Center, College of Southern Idaho - Twin Falls; we hold regularly scheduled monthly meetings and observation sessions, at which we share information on current astronomical events, tools and techniques for observation, astrophotography, astronomical computer software, and other topics concerning general astronomy. Members enthusiastically share their telescopes and knowledge of the night sky with all who are interested. In addition to our monthly public star parties we hold members only star parties at various locations throughout the Magic Valley.

MVAS promotes the education of astronomy and the exploration of the night sky along with safe solar observing through our public outreach programs. We provide two types of outreach; public star parties and events open to anyone interested in astronomy, and outreach programs for individual groups and organizations (e.g. schools, churches, scout troops, company events, etc.), setting up at your location. All of our outreach programs are provided by MVAS volunteers at no cost. However, MVAS will gladly accept donations. Donations enable us to continue and improve our public outreach programs.

Membership is not just about personal benefits. Your membership dues support the work that the Magic Valley Astronomical Society does in the community to promote the enjoyment and science of astronomy.
Speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs just to name a few of the programs that your membership dues support.

Annual Membership dues will be:
$20.00 for individuals, families, and $10.00 for students.
Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com

Donations to our club are always welcome and are even tax deductible. Please contact a board member for details.

Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others please contact President Gary Leavitt, for more information on these and other benefits.

Telescopes are an individual thing and not practical for public use. However, everyone should have the experience of a good look at the moon for at least 5 minutes in their life time. It is a dimension and feeling that is unexplainable. Pictures or TV can't give this feeling, awareness, or experience of true dimension. A person will not forget seeing our closest neighbor, the moon.

Norman Herrett in a letter to Dr. J. L. Taylor, president of the College of Southern Idaho, Twin Falls, ID, USA.