

# SkyWatcher

The Newsletter of the Boise Astronomical Society

July 2020



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Member - Astronomical League



Member - NASA Night Sky  
Network



[www.boiseastro.org](http://www.boiseastro.org)

<https://groups.io/g/BoiseAstro>

## President's Message

The BAS Pizza and Ice Cream Social will be held on Friday, July 10<sup>th</sup>, 2020 at 6:30 pm. We are tentatively scheduled to meet at the Paramount subdivision clubhouse (5695 N Fox Run Wy, Meridian). Due to the COVID-19 Pandemic we **will not** be using Anser Charter School for the foreseeable future and this location became available. It is in the subdivision where Irwin lives and the address and directions are available on our Groups.io page. Please remember this is a member's only affair and you may join at the door.

The COVID-19 Pandemic has caused us to make lifestyle changes and as of this writing, I will be monitoring the situation in Ada County and elsewhere, and after the Holiday weekend, we may make a GO / NO-GO on the Pizza and Ice Cream Social.

When you register for the Idaho Star Party™ this year, please hold your payment until after July 1<sup>st</sup> to verify that we are going to be able to hold this year's ISP at Bruneau. With the re-opening plan we will know more near the end of June. Updates will follow at our July Pizza and Ice Cream Social.

To keep all up to date, I have been told by the Park Asst. Manager at Bruneau Dunes that the Observatory and Steel-Reese Building will remain closed through the end of August. As before, we are monitoring the COVID-19 Pandemic situation and due to the rise in cases may decide it not prudent to hold the Idaho Star Party™.

Our ISP T-shirt design contest is still open to all dues-paying members. Deadline for submissions to any BAS officer is now August 1<sup>st</sup> and we will vote on them at our August general meeting. The theme this year will be: "The Formation of Galaxies Revealed by the Largest Time Machines." Please check our Groups.io page for updates.

There are two scheduled star parties this month. Due to the COVID-19 restrictions, we will be limiting these star parties to **members only**. Face Masks and Social Distancing will be required. The first is scheduled for the 11<sup>th</sup> at the Dedication Point Dark Sky site; details will be posted to our Groups.io page. The second star party is scheduled for the 18<sup>th</sup> at the Idaho City Rabbit Creek site. We will be posting our Go / No-Go message to groups.io before the monthly star parties.

That's it for this month.

David Olsen, President BAS

## July 2020 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			<div style="text-align: right; font-weight: bold;">1</div> <b>BAS Board Meeting</b>  7:00 pm via Zoom teleconference	2	<div style="text-align: right; font-weight: bold;">3</div> <b>BSU 1<sup>st</sup> Friday Astronomy</b>  see below calendar for details	4 <div style="text-align: center; color: red; font-weight: bold; margin-top: 10px;">Fourth of July</div> 
5 Thunder Moon 10:44 pm  Visible 100% Age: 15.09 Days	6	7	8	9	<div style="text-align: right; font-weight: bold;">10</div> <b>Pizza &amp; Ice Cream Social</b>  6:30 pm Paramount clubhouse 5695 N Fox Run Wy, Meridian	<div style="text-align: right; font-weight: bold;">11</div> <b>Dedication Pt Star Party</b>  9:30 pm  Be Safe (WEAR a MASK)
12 Last Quarter Moon  Visible: 55% ↓ Age: 21.72 Days	13	14	15	16	17	<div style="text-align: right; font-weight: bold;">18</div> <b>Star Party Idaho City</b> (Rabbit Creek) 9:30 pm  Be Safe (WEAR a MASK)
19 New Moon → JULY 20 →  Visible 0% Age: 29.30 Days	20	21	22	23	24	25
26	27 First Quarter Moon  Visible 50% ↑ Age: 7.35 Days	28	29	<div style="text-align: right; font-weight: bold;">30</div> <b>Launch of Mars Perseverance</b> 9:15 am EDT (7:15 am MDT)	31	

**BSU 1<sup>st</sup> Friday Astronomy: July 3<sup>rd</sup>**, Online Lecture begins at **8:30 pm MDT**  
**“What are these yellow balls?”** by Prof Kathryn Devine, Math & Physical Sci Dept, College of Idaho  
<http://www.astrojack.com/ffa-yellowballs>

Scheduled for **Aug 7<sup>th</sup>**: **Dr Paul Verhage**, Treasure Valley Math & Science Center, **“Sub-Orbital Ballooning”**

# Boise Astronomical Society

## Join the Boise Astronomical Society – Membership has its privileges

link: <https://www.boiseastro.org/>

Hello and welcome to our club! We hope you enjoy our newsletter, from current news and celestial events to a cosmic challenge and a bit of space history.

We meet on the 2<sup>nd</sup> Friday of each month in rooms at the Anser Charter School at 202 E 42<sup>nd</sup> St, Garden City. Our meetings feature an interesting program or presentation and the opportunity to spend time with other astronomy enthusiasts.

### A star party is a gathering of amateur astronomers for the purpose of observing the sky

Observing the night sky is always an exciting journey but having others to share the experience with makes it even better. We typically have two Star Parties each month around the New Moon; refer to the calendar on page 2 of this newsletter or join our online Group (see below) for scheduled dates. We usually meet up at Dedication Point, which is on Swan Falls Road, about 16 miles south of Kuna. During the summer months, we move to a dark sky site at Granite Creek near Idaho City. These events are free and you don't have to bring your own telescope. Those who bring a telescope are more than happy to share views. Star Parties may be planned around a specific celestial event or just on a clear night. Either way, observing together gives everyone an opportunity share knowledge, meet new people, and gain experience in stargazing that otherwise may not have been possible.

### How to Join the Boise Astronomical Society

Annual dues are \$25 per Household for the calendar year running from January 1 to December 31. Click here to print the membership application form: [https://www.boiseastro.org/uploads/1/2/2/0/122041477/new\\_member\\_application\\_2018.pdf](https://www.boiseastro.org/uploads/1/2/2/0/122041477/new_member_application_2018.pdf).

This includes all family members living at the same address. Mail your application and dues to us at: (and *please make checks payable to*)

**Boise Astronomical Society**  
**PO Box 7002**  
**Boise, Idaho 83707**

Membership entitles you to attend all BAS Star Parties, educational outreach programs and membership/guest speaker meetings. Your literary contributions are welcomed and encouraged. Owning a telescope is NOT a requirement of joining the club. Membership also includes, but is not limited to:

1. Membership in the Astronomical League.
2. Discounts on subscriptions to *Astronomy* and *Sky & Telescope* magazines.
3. Volunteer star party opportunities.
4. Camping and star party opportunities.
5. First opportunity at Idaho State Parks (ISP) campsite reservations.
6. Field trips to area planetariums.

### Join us on Groups.io

We encourage you join our online Group as this is how we communicate between our monthly meetings. It's easy and it's free. To start, use this link to create an account: <https://groups.io/register>. Of the (3) account-creation methods shown, we recommend that you enter your current email address and create a password; this will ensure that you'll get real-time 'Go/No-Go' notices for Star Parties. The link to our group is <https://groups.io/g/BoiseAstro>. Please keep all postings on BAS-related topics. Please ensure all conversations follow civil discourse and are related to astronomy.

You are also most welcome to join our Facebook group, whether you are a member or not. Please keep conversations and postings (including sales) to a civil discourse and be related to astronomy. Also, we are now using [Twitter](#), although sparingly.



## NASA Night Sky Notes

### Mars's Latest Visitor: NASA's Perseverance Rover

by David Prosper

NASA's latest Mars rover, *Perseverance*, is launching later this month! This amazing robot explorer will scout the surface of Mars for possible signs of ancient life and collect soil samples for return to Earth by future missions. It will even carry the first off-planet helicopter: *Integrity*. Not coincidentally, *Perseverance* will be on its way to the red planet just as Mars dramatically increases in brightness and visibility to eager stargazers as the two planets race towards their closest approach in October of this year.

Observe Mars yourself over the next few months! Mars can be found in early morning skies throughout July, and by the end of the month will rise before midnight. Mars gradually brightens every night until the close approach of Mars in October. The pre-dawn skies of July 17 present an especially nice view (see image at right), as the waning crescent Moon will appear near Venus and Aldebaran.



*Perseverance's* engineers built upon the success of its engineering cousin, *Curiosity*, and its design features many unique upgrades for a new science mission. In February of 2021, *Perseverance* will land at the site of an ancient river delta inside Jezero Crater and ready its suite of seven primary scientific instruments. The rover will search for traces of past life, including possible Martian fossils, with WATSON and SHERLOC, two advanced cameras capable of seeing tiny details. The rover also carries an amazing instrument, SuperCam, to blast rocks and soil outside of the rover's reach with lasers to determine their chemical makeup with an onboard suite of cameras and spectrometers. *Perseverance* will also take core samples of some of the most promising rocks and soil, storing them for later study with a unique caching system. Future round-trip missions will retrieve these samples from the rover and return them for detailed study by scientists back on Earth. *Perseverance* also carries two microphones so we can hear both the sounds of Mars and the noises of its instruments at work. It will launch the helicopter *Ingenuity* into the Martian atmosphere as a trial for future aerial exploration.



Artist rendering of *Perseverance* inspecting a cluster of interesting Martian rocks with its instruments. (NASA JPL/Caltech)

Would you like to contribute to Mars mission science? You can help NASA's rover drivers safely navigate the Martian surface by contributing to the AI4Mars project! Use this tool to label terrain features on photos taken of the Martian surface by NASA missions to help train an artificial intelligence algorithm to better read their surrounding landscape: [bit.ly/AI4Mars](https://bit.ly/AI4Mars)

The launch of Mars *Perseverance* is, as of this writing, scheduled for July 20, 2020 at 9:15 am EDT. More details, updates, and livestreams of the event are available on NASA's official launch page: [bit.ly/Mars2020Launch](https://bit.ly/Mars2020Launch) . Dig deep into the science of the Mars 2020 mission and the *Perseverance* rover at: [mars.nasa.gov/mars2020/](https://mars.nasa.gov/mars2020/) . Find out even more about past, present, and future Mars missions at [nasa.gov](https://nasa.gov).

## Dave Mitsky's Celestial Calendar

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

- 7/1 Mercury is in inferior conjunction with the Sun (0.563 astronomical units from the Earth; latitude -5.5 degrees) at 3:00
- 7/2 The Moon is 6.3 degrees north-northeast of the first-magnitude star Antares (Alpha Scorpii) at 2:00; asteroid 532 Herculina (magnitude +9.5) is at opposition in Sagittarius at 14:00
- 7/4 The Moon is at the descending node (longitude 269.1 degrees) at 3:00; Earth is at aphelion (152,095,295 kilometers or 94,507,635 miles from the Sun) at 12:00
- 7/5 A shallow penumbral eclipse of the Moon begins at 3:07; Full Moon, known as the Hay or Thunder Moon, occurs at 4:44; 4 Vesta is in conjunction with the sun at 6:00; the Moon is 1.9 degrees southeast of Jupiter at 22:00
- 7/6 The Moon is 2.5 degrees south of Saturn at 10:00
- 7/8 Mars is at its greatest heliocentric latitude south at 1:00 (-1.8 degrees); Venus is at its brightest (magnitude -4.7) at 12:00
- 7/10 Venus is at greatest illuminated extent (47.4 square arc seconds) at 8:00; the Moon is 4.1 degrees southeast of Neptune at 12:00; Venus is at aphelion (0.7282 astronomical units) at 14:00
- 7/11 Mars passes north of the celestial equator at 12:00; the Moon is 1.8 degrees southeast of Mars at 22:00
- 7/12 Venus is 1.0 degree north of the first-magnitude star Aldebaran (Alpha Tauri) at 2:00; Mercury is stationary, with prograde or direct (eastward) motion to resume at 7:00; the Moon is at apogee, subtending 29' 34" from a distance of 404,199 kilometers (251,158 miles) at 19:27; Last Quarter Moon occurs at 23:29
- 7/13 Asteroid/dwarf planet 1 Ceres is stationary at 2:00; asteroid 2 Pallas (magnitude +9.6) is at opposition in Vulpecula at 2:00; Mercury is at its greatest heliocentric latitude south (-7.0 degrees) at 10:00
- 7/14 The Curtiss Cross, an X-shaped clair-obscur illumination effect located between the craters Parry and Gambart, is predicted to be visible at 1:55; Jupiter is at opposition (apparent size 47.6", magnitude -2.8) at 8:00; the Moon is 3.5 degrees southeast of Uranus at 15:00
- 7/15 Mercury (magnitude +1.6) is 6.0 degrees southeast of the bright open cluster M35 in Gemini at 3:00; Pluto is at opposition (apparent size 0.1", magnitude +14.3) at 12:00
- 7/16 The Moon is 6.6 degrees southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 8:00
- 7/17 The Moon is 3.7 degrees north of Aldebaran at 1:00; the Moon, Venus, and Aldebaran lie within a circle with a diameter of 4.1 degrees at 2:00; the Moon is 3.1 degrees north of Venus at 7:00
- 7/18 The Moon is at the ascending node (longitude 89.0 degrees) at 13:00; the Moon is 0.6 degrees southeast of the bright open cluster M35 in Gemini at 19:00
- 7/19 The Moon is 3.9 degrees north of Mercury at 5:00
- 7/20 The Moon is 8.2 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 6:00; the Moon is 4.5 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 10:00; the Sun enters Cancer (ecliptic longitude 118.3 degrees) at 13:00; New Moon (lunation 1207) occurs at 17:33; Saturn is at opposition (apparent size 18.5", magnitude +0.1) at 22:00
- 7/21 The Moon is 2.0 degrees north-northeast of M44 (the Beehive Cluster or Praesepe) at 10:00
- 7/22 The Sun's ecliptic longitude is 120 degrees at 9:00; Mercury is at greatest western elongation (20.1 degrees from Sun) at 15:00
- 7/23 The Moon is 4.1 degrees north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 0:00
- 7/25 The Moon is at perigee, subtending 32' 26" at a distance of 368,361 kilometers (228,889 miles) at 5:02; the equation of time, which yields the difference between mean solar time and apparent solar time, is at a minimum of -6.55 minutes at 18:00
- 7/26 The Moon is 6.7 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 19:00
- 7/27 The First Quarter Moon occurs at 12:33; the Lunar X, also known as the Werner or Purbach Cross, an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to be fully formed at 13:25
- 7/29 The peak of the Southern Delta Aquarid meteor shower (a zenithal hourly rate of 20 per hour) is predicted to occur at 22:00
- 7/30 The Moon is 6.2 degrees north-northeast of Antares at 3:00
- 7/31 The Moon is at the descending node (longitude 268.6 degrees) at 10:00

*Happy Birthdays in July*  
Friedrich Bessel (1784-1846)

## On this date in history . . .

July 1, 1770: Comet D/1770 L1 (Lexell) passed closer to the Earth than any comet in recorded history.

July 1, 1847: Karl Ludwig Hencke discovered asteroid 6 Hebe.

July 4, 1054: The light from Supernova SN 1054 was first noted by Chinese astronomers.

July 6, 1938: Seth Nicholson discovered Neptune's satellite Lysithea.

July 8, 1933: Karl Jansky announced the detection of radio radiation from the center of the Milky Way.

July 11, 2012: Pluto's satellite Styx is discovered using images from the New Horizon probe.

July 13, 1784: The globular cluster NGC 6569 in Sagittarius was discovered by William Herschel.

July 14, 1965: The Mariner 4 probe took the first close-up image of another planet, namely Mars.

July 16, 1994: Fragments of Comet D/1993 F2 (Shoemaker-Levy) impacted Jupiter.

July 17, 1850: The first photograph of a star, namely Vega, was taken.

July 18, 1999: Prospero, one of the satellites of Uranus, is discovered by Matthew Holman.

July 20, 1969: The Apollo 11 lunar module landed on the Moon.

July 21, 1914: Sinope, one of Jupiter's many satellites was discovered by Seth Nicholson.

July 23, 1783: Caroline Herschel discovered the open cluster NGC 6866 in Cygnus.

July 24, 1778: Charles Messier discovered the globular cluster M54 in Sagittarius.

July 24, 1853: Hendri Deslandres invented the spectroheliograph.

July 26, 1609: The first lunar map was drawn by Thomas Harriot.

July 27, 1764: Charles Messier discovered the globular cluster M28 in Sagittarius.

July 27, 1989: Neptune's satellites Despinea and Galatea are discovered using images from *Voyager 2*.

July 28, 1851: The first photograph of a total solar eclipse was taken.



### The Sun, the Moon, & the Planets

The **Sun** is located in Gemini on July 1st. The Earth is farthest from the Sun, a distance of 1.0167 astronomical units, on July 4th, when it is 3.3% more distant than it was at perihelion and 1.7% farther than its average distance. The Sun enters Cancer on July 20th.

The **Moon** is 9.6 days old, is illuminated 77.4%, subtends 32.6 arc minutes, and is located in Libra on July 1st at 0:00 UT. The Moon is at its greatest northern declination of +23.9 degrees on July 19th and its greatest southern declination of -24.1 degrees on July 5th. Longitudinal libration is at a maximum of +5.0 degrees on July 6th and a minimum of -5.4 degrees on July 19th. Latitudinal libration is at a maximum of +6.8 degrees on July 11th and a minimum of -6.7 degrees on July 25th. Favorable librations for the following lunar features occur on the indicated dates: Mare Australe on July 2nd, Mare Smythii on July 4th, Crater Mouchez on July 13th, and Crater Pascal on July 14th. New Moon takes place on July 20th. The Moon is at apogee (a distance of 63.37 Earth-radii) on July 12th and at perigee (a distance of 57.75 Earth-radii)

on July 25th. A penumbral lunar eclipse visible from Antarctica, Africa, western Europe, North and South America, and the eastern Pacific Ocean takes place on July 5th. Greatest eclipse occurs at 4:30:02 UT1.

**Mercury** is in inferior conjunction on July 1st and is at its most southerly latitude from the ecliptic plane on July 13th. Mercury reappears in the morning sky around July 17th. A waning crescent Moon passes four degrees north of the planet on the morning of July 19th. Greatest western elongation occurs on July 20th. On that date, Mercury shines at magnitude +0.3. It brightens to magnitude -0.1 by July 25 and magnitude -0.7 by July 31st.

**Venus** shrinks in apparent size from 43.1 to 27.5 arc seconds as it increases in illumination from 19 to 42%. During July, the planet's altitude at sunrise increases steeply from 21 to 35%. Venus travels through Melotte 25 (the Hyades) during the first part of the month. Venus is at greatest brilliancy on July 10th. It attains greatest illuminated extent and is also at aphelion on July 11th and passes one degree north of Aldebaran on the night of July 12th. A waning crescent Moon passes three degrees north of the brightest planet on the morning of July 17th. Venus lies 2.3 degrees southeast of the third-magnitude star Zeta Tauri by the end of the month.

**Mars** brightens from magnitude -0.5 to magnitude -1.1 and grows in apparent size from 11.4 to 14.5 arc seconds this month. The Red Planet rises around 11:15 p.m. local time by the end of July. It moves north of the celestial equator for the first time since last October on July 11th. The waning gibbous Moon passes two degrees south of the Mars on July 11th. Mars enters northwestern Cetus on July 8th but returns to Pisces near the end of the month.

During July, **Jupiter** travels four degrees to the west, relative to the fixed stars of Sagittarius. The Full Moon passes less than two degrees to the south of the gas giant planet on the night of July 5th. Jupiter is at opposition on July 14th and is at its peak elevation of about 30 degrees for observers at 40 degrees north at local midnight. Jupiter subtends 47.6 arc seconds and shines brightly at magnitude -2.8 on that date. Information on Great Red Spot transit times and Galilean satellite events is available on pages 50 and 51 of the [July 2020 issue of Sky & Telescope](#).

**Saturn's** disk subtends over 18 arc seconds and its rings, which are inclined almost 22 degrees, span 42 arc seconds. Saturn is located six degrees to the east of Jupiter on July 1st. On July 6th, a nearly Full Moon passes two degrees south of the Ringed Planet. Saturn is at opposition on July 20th. Eighth-magnitude Titan is due north of Saturn on July 15th and July 31st and due south of the planet on July 7th and July 23rd. The faint Saturnian satellite Iapetus is positioned one arc minute due north of Saturn on the nights of July 27th and July 28th.

**Uranus** can be found in southwestern Aries about half-way between the second-magnitude star Hamal (Alpha Arietis) and the third-magnitude star Menkar (Alpha Ceti). A waning crescent Moon passes less than four degrees southeast of Uranus on July 14th. Visit [the Naked Eye Planets site](#) for a finder chart.

**Neptune** is located in eastern Aquarius about four degrees east-northeast of the fourth-magnitude star Phi Aquarii. A gibbous Moon passes four degrees southeast of Neptune on July 10th. The asteroid/dwarf planet 1 Ceres lies 13.5 degrees south of Neptune on July 1st. That distance increases to 16 degrees by the end of the month. Browse [this Naked Eye Planets site](#) for a finder chart.

The dwarf planet **Pluto** is 41 arc minutes south of Jupiter on July 1st. It reaches opposition on July 15th. Finder charts can be found on pages 48 and 49 of the July 2020 issue of Sky & Telescope and on page 243 of the RASC Observer's Handbook 2020.

**Jupiter & Saturn** are in the southeast during the evening. At midnight, **Mars** is in the east, **Jupiter & Saturn** are in the south, and **Neptune** is in the southeast. In the morning, **Mercury** can be found in the northeast, **Venus & Uranus** in the east, **Mars & Neptune** in the south, and **Jupiter & Saturn** in the southwest.

**Jupiter, Saturn, Pluto**, and **asteroid 2 Pallas** all achieve opposition this month. The **Moon** forms a compact equilateral triangle with **Jupiter & Saturn** on the night of July 5th. The **Moon, Venus, & Aldebaran** lie within a circle with a diameter of 4.1 degrees on July 17th. All seven major planets can be seen in the morning in late July.

For more on the planets and how to locate them, browse [Naked Eye Planets](#).

Free star maps for July can be downloaded at [Skymaps](#).

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

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**Comet C/2017 T2 (PanSTARRS)** heads southeastward through Canes Venatici and Coma Berenices this month. The fading comet passes less than two degrees to the west of Beta Comae Berenices on July 19th and less than five degrees to northeast of the globular clusters M53 and NGC 5053 on July 30th. The faint periodic comet 88P/Howell passes less than two degrees from Spica around the time of the New Moon. Visit [Comet Chasing Skyhound](#) and [Aerith website](#) for info on comets visible this month.

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**Asteroid 56 Melete**, which was at opposition on June 28th, travels southwestward through the region of Scutum, Serpens Cauda, and Ophiuchus, skimming through the dark nebulae LDN 453 and LDN 431. Asteroid 532 Herculina (magnitude +9.5) is at opposition on July 2, asteroid 2 Pallas (magnitude +9.6) is at opposition on July 13th, and asteroid 129 Antigone (magnitude +10.4) is at opposition on July 15th. On July 31st, 1 Ceres lies 0.8 degrees northwest of the third magnitude star 88 Aquarii.

Information on asteroid occultations taking place this month is available at [Asteroid Occultations](#).

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The peak of the Southern Delta Aquarid **meteor shower** on the morning of July 29th is not compromised by moonlight. The radiant is located northwest of the first-magnitude star Fomalhaut (Alpha Piscis Austrini). Southern hemisphere observers are favored. Click on [Earth and Sky](#) for further information. The Alpha Capricornids, the Piscis Austrinids, and the Northern Delta Aquarids are the other minor meteor showers with southern radiants occurring this month. A list of the year's meteor showers appears on page 254 of the RASC's Observer's Handbook 2020.

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You are welcome to access the Cloudy Nights site for many more details from Dave Mitsky.

<https://www.cloudynights.com/topic/715195-july-2020-celestial-calendar/>

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I did find a *really* fascinating news story for you all: **NASA has just released a [Time-lapse Film of the Sun](#)**

The NASA [Solar Dynamics Observatory](#) (SDO) has been studying the Sun almost continuously for the last ten years, starting around June 2010, from its orbit around Earth. There are three instruments aboard: the Helioseismic and Magnetic Imager, the Extreme Ultraviolet Variability Experiment, and the Atmospheric Imaging Assembly (AIA). The AIA has been imaging "the outer layer of the Sun's atmosphere, the corona, at all temperatures from 20 thousand to 20 million degrees" using four telescopes, each producing "eight full-Sun images every ten seconds, twenty-four hours a day, seven days a week." After 10 years, this amounted to 425 million high-res images. The film made from these images "condenses a decade of the Sun into 61 minutes." Scientists were even able to study Venus' atmosphere when it transited the Sun! The images below and at the end of our newsletter, can be explored further on the [SDO website](#).

(all images below Credit: NASA/SDO)

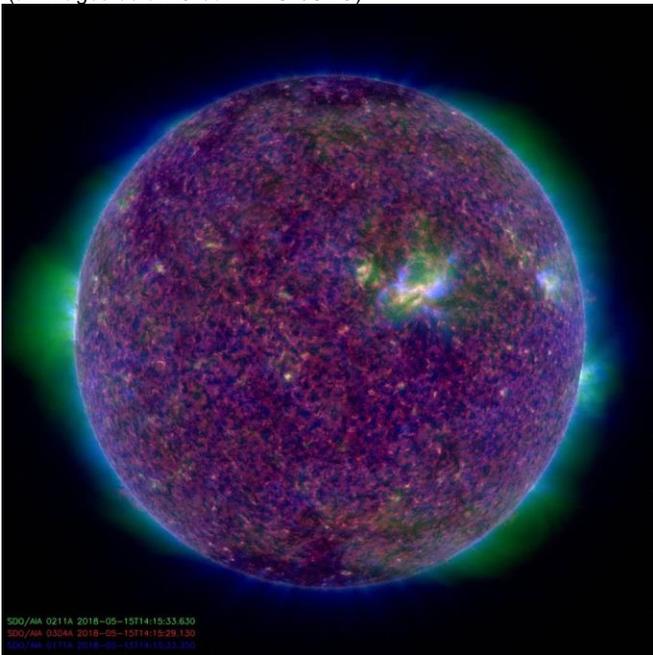


Image taken May 15, 2018



Solar flares and coronal mass ejection, July 14, 2017

# Phil Harrington's Cosmic Challenge

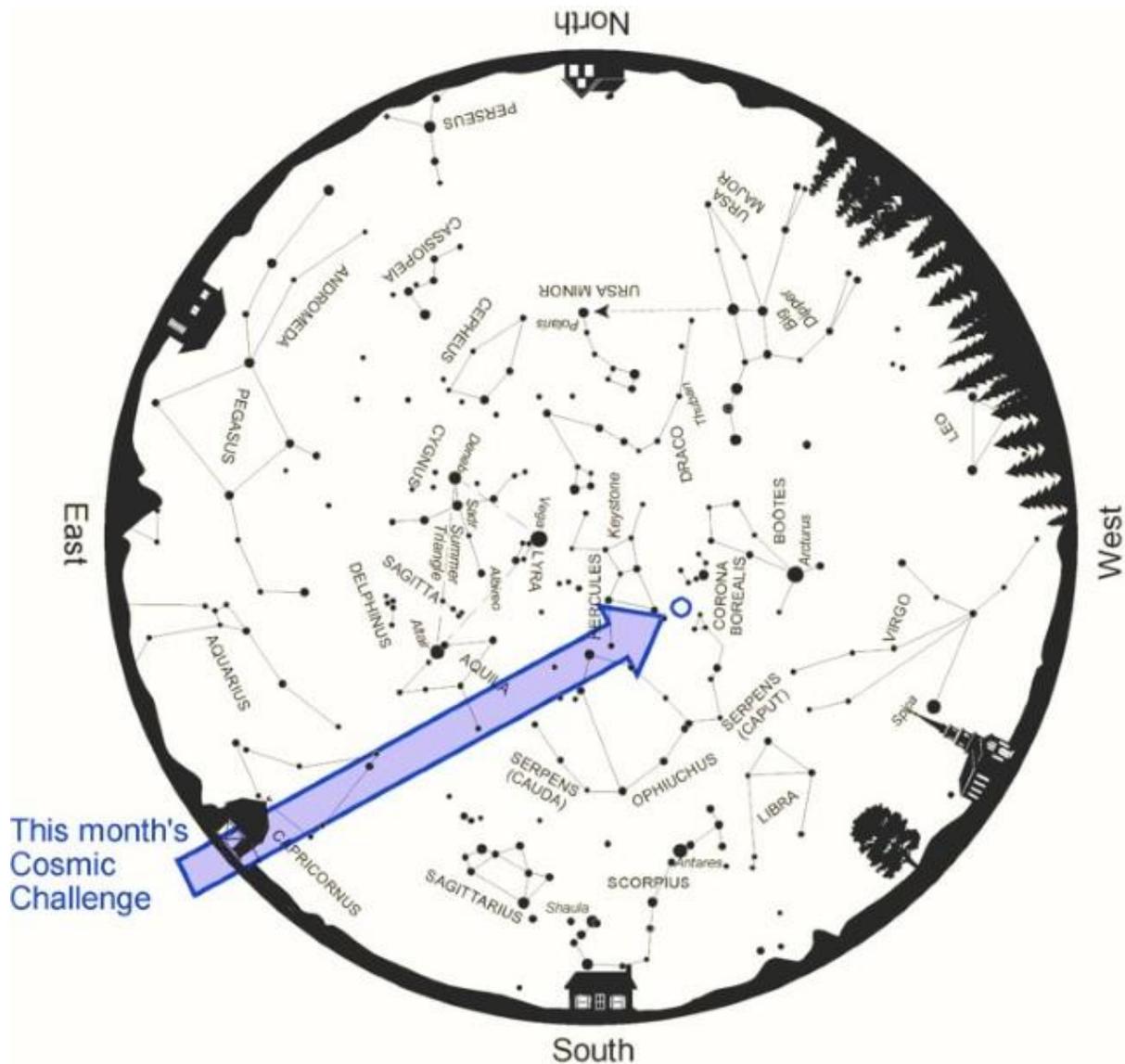
## Seyfert's Sextet



Monster scopes 15+ inch (38+ cm)

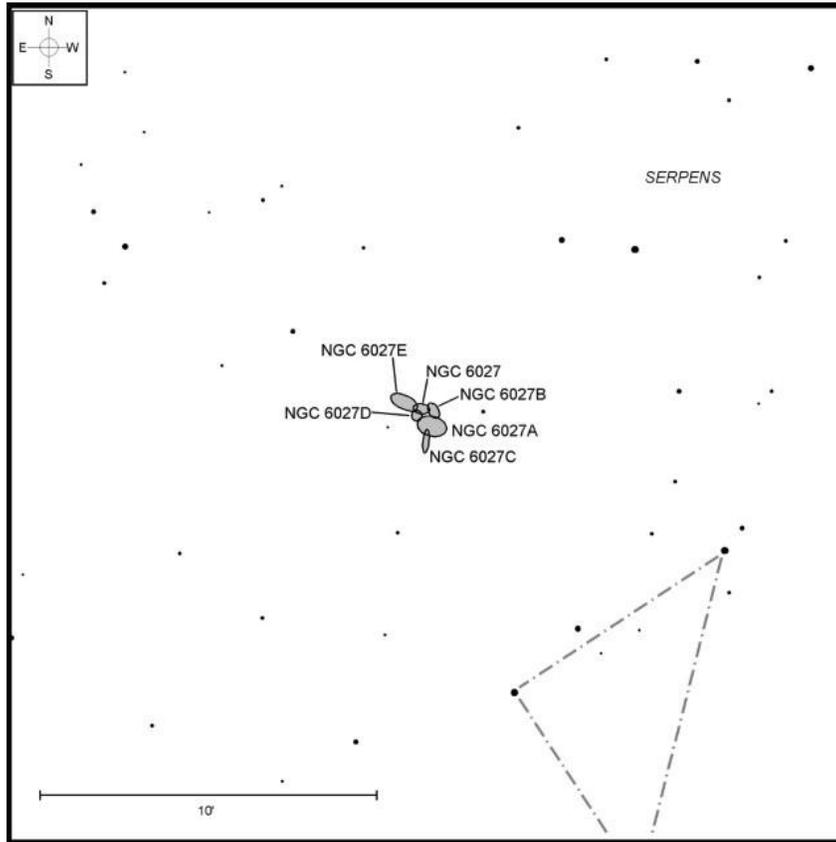
Target	Type	RA	DEC	Const.	Magnitude	Size
Seyfert's Sextet	Galaxy group	15h 59.2m	+20° 45'	Serpens	see detailed list below	1'

**Seyfert's Sextet**, known to many as **Hickson Compact Galaxy Group 79**, is a tight gathering of galaxies in the northern corner of Serpens Caput. Serpens Caput is the western segment of this bisected constellation, marking the triangular head of the serpent that Ophiuchus is handling. Observing Seyfert's Sextet has been one of my pet projects for years. It's a fun little galactic rat pack for summer outings before we plunge headlong into the summer Milky Way.



Spring star map showing the location of this month's Cosmic Challenge.

The nickname "Seyfert's Sextet," however, is inaccurate for a couple of reasons. First, technically speaking, Karl Seyfert did not discover Seyfert's Sextet. Instead, the group's primary galaxy, NGC 6027, was found by Édouard Stephan, director of the Marseilles Observatory, while observing through the observatory's 31.5-inch (80-cm) reflector in June 1882. That was the same telescope that Stephan was using when he found another, more famous galactic bunch, his namesake [Stephan's Quintet](#) in Pegasus.



Stephan's notes record only a single object, however, although he also noted two very faint stars as "involved." In historical retrospect, those two stars were actually two of the other galaxies that likely went unrecognized because of their small size. Seyfert discovered their true nature, and also spotted several additional members while scrutinizing a photographic plate taken of the region at Harvard College Observatory in 1951. Seyfert later reported his findings in a short paper entitled [A Dense Group of Galaxies in Serpens](#), where he also noted that the group was 27 million light years away.

Although five auxiliary NGC numbers -- NGC 6027a through 6027e --- were assigned to the galaxies recorded on the Harvard plate, Seyfert questioned whether or not he was looking at a group of six galaxies, or perhaps only four or five. He acknowledged that his colleague Walter Baade, a staff member of Mount Wilson Observatory, believed that the objects labeled as NGC 6027c and 6027d were actually tidal anomalies created by the interactions among the others.

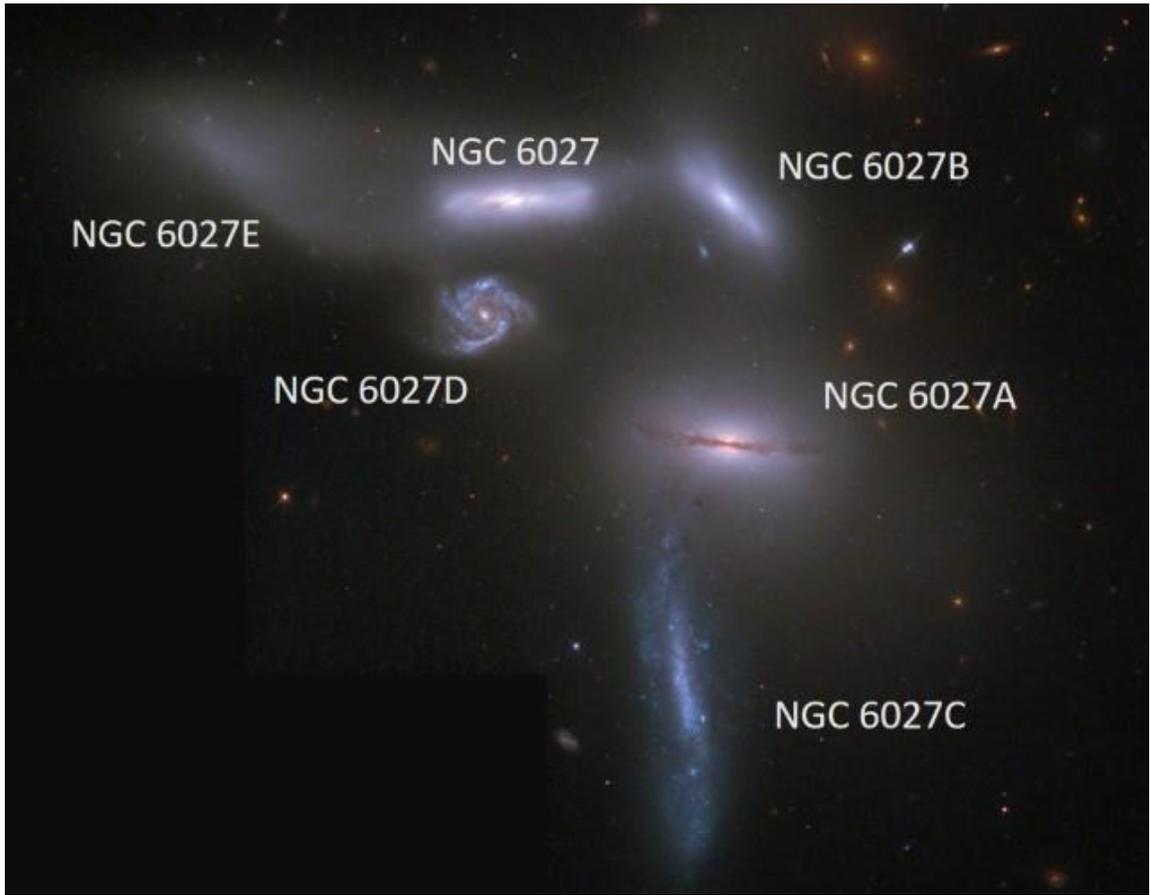
**Seyfert's Sextet**

Galaxy	RA	Dec	Magnitude	Size (')
NGC 6027	15 59.2	+20 45.8	14.7	0.5'x0.3'
NGC 6027A	15 59.2	+20 45.3	15.4	0.9'x0.6'
NGC 6027B	15 59.2	+20 45.8	15.4	0.5'x0.3'
NGC 6027C	15 59.2	+20 44.8	16	0.7'x0.2'
NGC 6027D	15 59.2	+20 45.6	15.6	0.3'x0.3'
NGC 6027E	15 59.2	+20 46.0	16.5	0.9'x0.4'

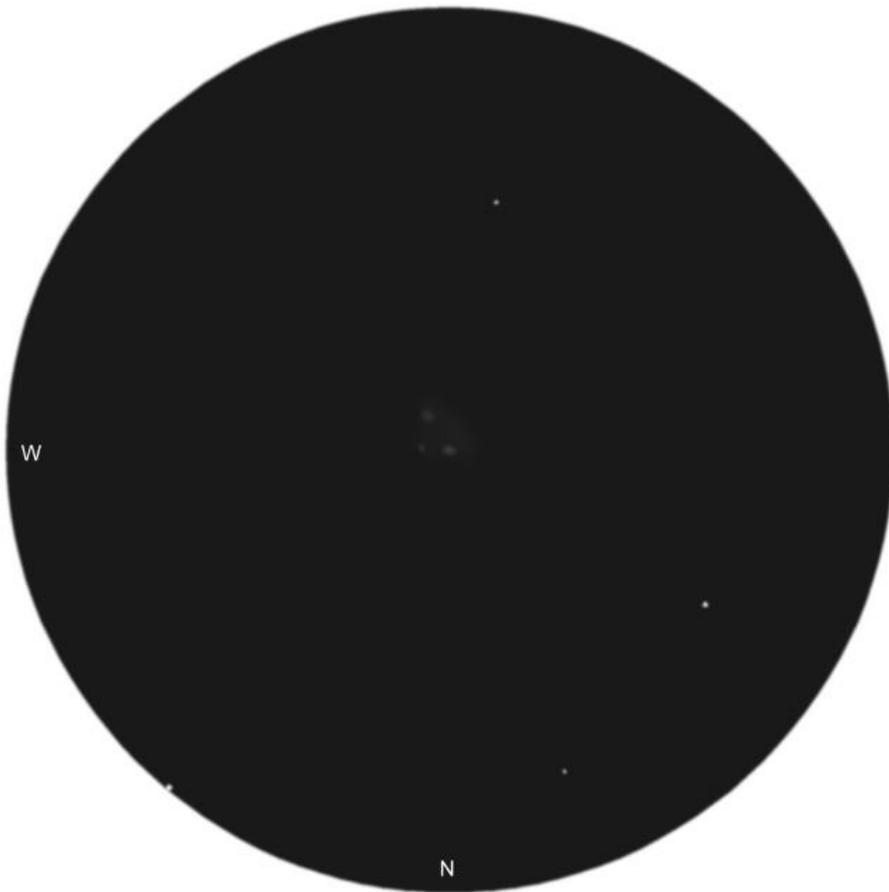
It turns out that Baade was correct. Seyfert's Sextet does not contain six galaxies; it contains only four. He was wrong, however, about which were tidally created mirages and which were actual galaxies. NGC 6027c and NGC 6027d are bona fide galaxies. Studies conducted with the Hubble Space Telescope, however, show quite clearly that NGC 6027e is not a separate galaxy, but instead, a gravitationally created plume extending away from NGC 6027. Such distortions are common features of galaxy groups as they swirl around each other and draw closer as time goes on. Ultimately, after hundreds of millions of years doing a galactic pirouette, the galaxies will ultimately merge to form a single, giant elliptical galaxy. That is, all will except NGC 6027d. This spiral galaxy is the background and just happens to lie along the same line of sight.

Seyfert's original distance estimate was off by a factor of seven. Current estimates place the four gravitationally related galaxies at about 190 million light-years away. NGC 6027d is well beyond, at an estimated 877 million light years.

Numbers and names aside, Seyfert's Sextet can be found 2° east-southeast of 5th-magnitude Rho (ρ) Serpentis, itself 3° north of the Serpent's triangular head. As a reference, look for a right triangle of 9th- and 11th-magnitude stars 10' southwest of the group, and a closer pair of 11th-magnitude stars 7' to its northwest.



*Credit: Hubble Legacy Archive, NASA, ESA; processed by Judy Schmidt*

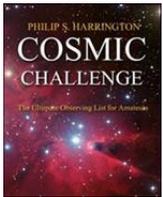


*Seyfert's Sextet as sketched through the author's 18-inch (45.7cm) reflector*

NGC 6027 should be a fairly easy catch in your scope, but the rest will take some effort to see. Under suburban skies, my 18-inch reflector at 171x shows it as a dim, glow, slightly elongated east-to-west and accented by a very dim central core, but that's about it. There is no sign of the dimmer group members until the magnification is increased to 294x, when the very faint glimmer from NGC 6027A can be seen just 36" to the south-southwest. NGC 6027B can also be suspected with averted vision just 20" west of NGC 6027. Darker skies are needed to confirm it with direct vision, as well as to suspect even the slightest hint of the other members of the bunch.

Have a favorite challenge object of your own? I'd love to hear about it, as well as how you did with this month's test. Contact me through my [web site](#) or post to this month's discussion forum.

Until next month, remember that half of the fun is the thrill of the chase. Game on!

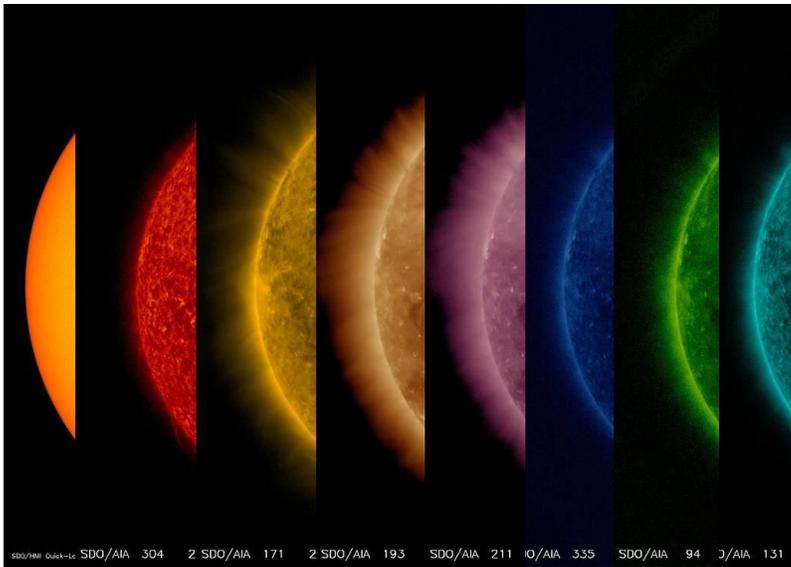


**About the Author:** Phil Harrington writes the monthly [Binocular Universe](#) column in [Astronomy](#) magazine and is the author of 9 books on astronomy. Visit his web site at [www.philharrington.net](http://www.philharrington.net) to learn more.

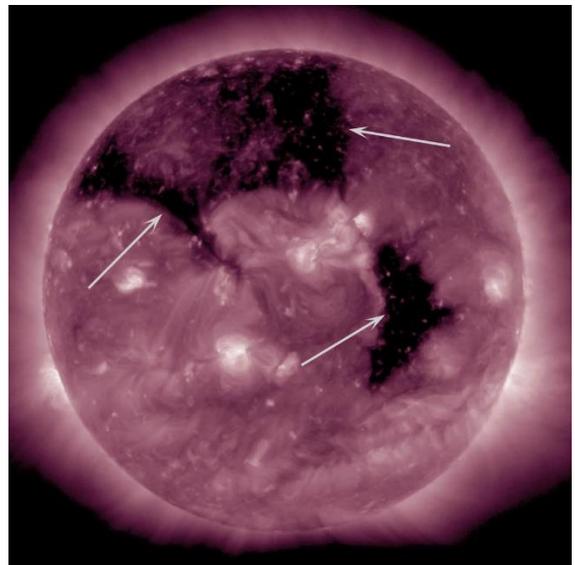
A revised, second printing of [Cosmic Challenge: The Ultimate Observing List for Amateurs](#) is now available with updated data tables and charts for finding various solar system objects, such as Pluto and Vesta, as well as improved renditions of the many eyepiece sketches that accompany each of the 187 challenges encompassing more than 500 individual objects. The book is available from [Amazon.com](http://Amazon.com).

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Here are more images from the [SDO website](#) (from tiny news story at the bottom of p. 8).



Sequence of images of Sun's surface (far left) up through all levels of the the Sun's atmosphere, taken Oct 27, 2017, progressing from least hot at the surface to almost 10 million°C in the upper atmosphere.



Here are 3 coronal holes seen on Sept 16, 2015. These holes give rise to the solar wind.

And don't forget our Bill Nye (CEO, The Planetary Society). Please continue to Stay Safe. Science says, "wear a mask."

*The End*

