

# SkyWatcher

The Newsletter of the Boise Astronomical Society

September 2020



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

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

## President's Message

The September BAS board meeting will be held on Wednesday, September 9<sup>th</sup> at 7:00 pm via zoom teleconference.

The next BAS membership meeting will be held Friday, September 18<sup>th</sup> at 7:00 pm, via Zoom teleconference. This month's guest speaker will be our Idaho Star Party™ (ISP) guest speake: Andreas Faisst, presenting on "The Formation of Galaxies Revealed by the Largest Time Machines."

For anyone who missed it last month, the ISP has been cancelled for 2020 due to the COVID-19 pandemic. While camping has opened, the other facilities have not. With the ongoing rise in cases of COVID-19 in Idaho, especially in Ada and Canyon Counties, and with several "at-risk" club members, the prudent decision was to suspend ISP.

Due to the lack of activities for 2020, the board has decided to extend all **paid/current** members of the Boise Astronomical Society memberships through the year 2021. Membership cards should have already gone out and you will not need to renew your dues for 2021.

I know some of you wish to get together for a meeting of some kind, but while school has resumed at our usual location, extracurricular events have not. The current situation (stage 3 in Ada County) has us on stand-by until January 2021. Members of the Board are hopeful a solution will present itself for the Holiday Party at least.

We do have two star parties scheduled for the month of September, the first is scheduled for Saturday, the 12<sup>th</sup> at 8:00 pm at Reynolds Creek Dark Sky site in Owyhee County. The second star party is scheduled for Saturday the 19<sup>th</sup> at Dedication Point, in lieu of the Idaho Star Party™. As usual, the Go/No-Go message will be posted to our [Groups.io](#) page and [Facebook](#) and [twitter](#) @boiseastro.

Finally, after many requests, our webmaster has enabled a link allowing members who would like to renew or join the club online may now do so securely on [our website](#). We continue to accept cash, checks, debit/credit cards via Square. Let your friends and family know.

Clear skies,

David Olsen, President  
Boise Astronomical Society

Would you like to JOIN the Boise Astronomical Society? See Last Page!

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## September 2020 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2 Corn Moon 11:23 pm  Visible 100% Age: 15.03 Days	3	4 <b>BSU 1<sup>st</sup> Friday Astronomy</b> see below calendar for details	5
6	7	8 <b>Near Earth Object</b> expected to pass by today  see p. 3 for details	9 <b>BAS Board Mtg</b>  7:00 pm via Zoom	10 Last Quarter Moon  Visible: 49% ↓ Age: 22.25 Days	11 <b>BAS General Mtg</b>  7:00 pm via Zoom	12 <b>Reynolds Creek Dark Sky site</b> Owyhee County 8:00 pm  Be Safe MASKs + distancing
13	14	15	16	17 New Moon  Visible 0% Age: 0.54 Days	18	19 <b>Dedication Pt Star Party</b>  8:00 pm  Be Safe MASKs + distancing
20	21	22	23	24 First Quarter Moon  Visible 55% ↑ Age: 7.81 Days	25	26 <b>Int'l Observe the Moon Night</b>  link to <a href="#">NASA site for event</a>
27	28	29	30			

**BSU 1<sup>st</sup> Friday Astronomy: Sept 4<sup>th</sup>**, Online Lecture begins at **7:30 pm MDT**

“Peering Through the Haze: Titan’s Fascinating Atmosphere & Surface”, Prof. Darci Snowden, Dept of Physics, CWU  
[www.astrojack.com/ffa-titan-haze](http://www.astrojack.com/ffa-titan-haze)

Scheduled for **Oct 2<sup>nd</sup>**: **Dr Laura Mayorga**, Space Telescope Science Institute

“The Solar System Laboratory: A Testbed for Exoplanet Studies”

## CITIZEN SCIENTISTS

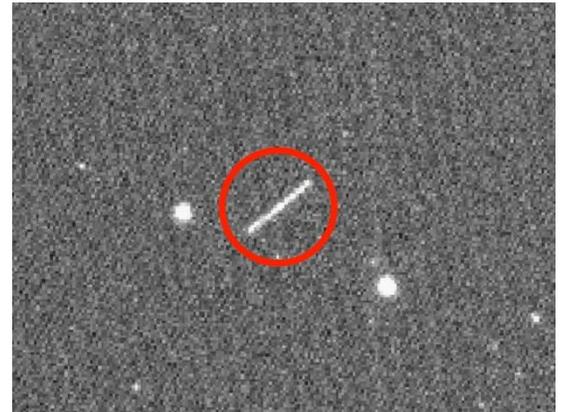
Last month, I shared a story with you wherein NASA was looking for your help to identify star nurseries (see [this website](#)). There have been other citizen science projects. NASA [recently reported](#) results from a project, [Backyard Worlds: Planet 9](#), that has garnered some great results. With help from folks like you, 95 brown dwarfs have been discovered, most within our local neighborhood of the Milky Way. The dataset for the Backyard Worlds project included NEOWISE data. Here is the interesting part - in the story from our August newsletter, we learned that brown dwarfs are the 'coolest' of stars, and the 95 recently identified brown dwarfs are on the cooler side of these cool stars.

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## WE DODGED AN ASTEROID LAST MONTH !

NASA [reported a Near Earth Asteroid](#) (NEA) that came closer than any other NEA recorded. On Sunday, August 16<sup>th</sup> asteroid 2020 QG – a little, SUV-sized rock ~15 feet in diameter travelling at ~8 miles/sec – passed 1,830 miles above the Earth, over the Indian Ocean. The good news is that IF it had been on target for Earth, it would have broken up and burned in the atmosphere, which is more common than is generally known. [Here is a NASA site](#) that is both interesting *and* disturbing; it depicts graphically all Earth (atmospheric) impacts from April 1988 to August 2020 – there's a whole lot! Furthermore, the graphic is *interactive*. Just hover your cursor over an 'event' to learn details. There's a fairly big one that burned up fairly close-ish to the Treasure Valley. On Nov 18, 2009, there was an impact at 40.4°N 113.2°W; this is just south and west of us at 43.6°N 116.2°W. The other good news is that the "vast majority" of the "hundreds of millions of small asteroids" pass safely by the Earth, "usually much farther away than the Moon."

Two things make this little asteroid special. First, little 2020 QG is "the closest known non-impacting asteroid" known. Apparently, it is quite difficult to see the little asteroids. Our little visitor was imaged as it was "heading away from Earth." The image at right shows that streak, and was taken by a snazzy new telescope at the [Zwicky Transient Facility](#) (ZTF) [image credit: ZTF/Caltech Optical Observatories].



"The ZTF is a new time-domain survey that had first light at Palomar Observatory in 2017. Building on the highly successful legacy of the Palomar Transient Factory (PTF), ZTF uses a new camera with a 47 square degree field of view, mounted on the Samuel Oschin 48-in Schmidt telescope. ZTF's extremely wide field and fast readout electronics enable a survey more than an order of magnitude faster than that of PTF."

The second thing that makes 2020 QG special is that its trajectory was bent almost 45 degrees as it zoomed by us. Earth's gravity 'pulled' the asteroid off its course. I think many of us have seen that PBS show (*The Elegant Universe??*) wherein Brian Greene demonstrates the effect of gravity by depicting space as a flat grid and various-sized round bodies rest on the grid, weighing it down and distorting the grid; then a small round body rolls by but its path is deflected by the 'weight' of a larger body.

And last, it's a little known fact that some five years ago, the US Congress directed NASA to identify 90% of the large NEAs (460+ feet). These asteroids could pose a threat if they were to impact Earth. Luckily, they are easier to detect, and from farther away.

Here are three interesting sites noted in this NASA story. First, the [Center for Near Earth Objects](#) is the place to learn about asteroids and such, like the next NEO will pass Earth this month (Sept 8, 2020). Second, pursuant to the directive from Congress, you can learn more about [NASA's Planetary Defense](#). And for those that can't get enough twitter, you can follow @AsteroidWatch for [news and updates](#).

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## WHAT'S UP IN SEPTEMBER

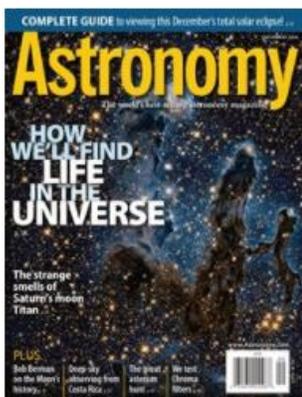
I found a new information webpage within the wonderful world of NASA. Each month they produce a video/podcast covering the night sky. The image at right is a snipping-tool-copy of the video link on the webpage for [September's night sky features](#).

The highlights for September include: the Moon and Mars are close in the predawn sky on Sept 6<sup>th</sup>; on Sept 13<sup>th</sup> and 14<sup>th</sup> a crescent Moon sidles up to Venus in the predawn sky; the bright star Fomalhaut can be found low in the south some hours after sunset, left of Saturn and Jupiter. There's an interesting story about Fomalhaut, so it's worth watching the video!



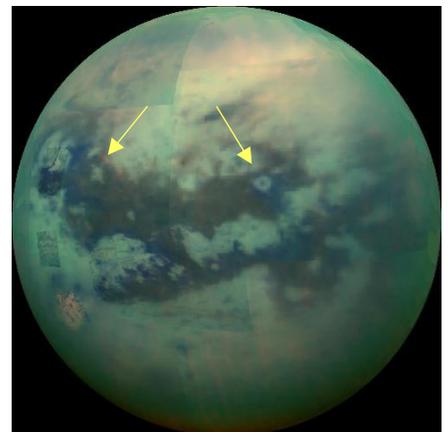
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## ASTRONOMY MAGAZINE FOR SEPTEMBER



I recently edited the information on our BAS website, for the 'JOIN' webpage. Our webmaster had added a feature to pay our annual dues *online*, so I updated the text on that page. By the time you read this, the page will be all new. While editing the information, I was reminded that as BAS members we get discounts on subscriptions to both *Astronomy* and *Sky and Telescope* magazines. Send me an email (see p.1 on left for email address) and I'll provide you with the necessary information.

There are a number of articles in the September 2020 issue of *Astronomy* that I'm looking forward to reading after I start my subscription. "How we'll find life in the universe" by Robert Naeye looks to be the most interesting, describing three different paths being pursued in the search. Another article that caught my eye is "What does Titan smell like?" by Morgan L Cable. Titan is that most fascinating of Saturn's moons. According to the blurb, the air on Titan is "a bouquet of musky sweetness, bitter almonds, gasoline, and decomposing fish." This somehow *does* fit in with this image of Titan, a composite of views by the Cassini probe [image credit: NASA/JPL/Univ of AZ/U of ID]. If you look at this image and tilt your head to the left and squint a bit, it almost looks like a smirking bald pirate (I added little arrows pointing to the eyes).



But seriously, this is the only moon in our system with a "substantial atmosphere." An astronaut in a heated space suit could walk on the surface with ease. And watch big raindrops slowly fall to ground. Raindrops are 50% bigger and fall six times more slowly than on Earth. And though its surface has solidly frozen water ice, beneath that ice is a liquid ocean that may have life as we know it. Perhaps the article on Life in the Universe will address Titan's ocean.

AND, Dr. Brian Jackson's 1<sup>st</sup> Friday Physics guest lecturer, Dr. Snowden, will be talking on Titan's atmosphere on September 4<sup>th</sup> at 7:30 pm; follow this link: [www.astrojack.com/ffa-titan-haze](http://www.astrojack.com/ffa-titan-haze)

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## Happy Birthdays in September

Konstantin Tsiolkovsky (1857 - 1935)

James Van Allen (1914 - 2006)

James W Christy (1938 - now)

Jean Baptiste Joseph Delambre (1749 - 1822)

Leon Foucault (1819 - 1868)

Ole Rømer (1644 - 1710)

Thomas Wright (1711 - 1786)

Saul Perlmutter (1959 - now)

Michael Maestlin (1550 - 1631)

Stamatios 'Tom' Krimigis (1938 - now)

## Summer Triangle Corner: Altair

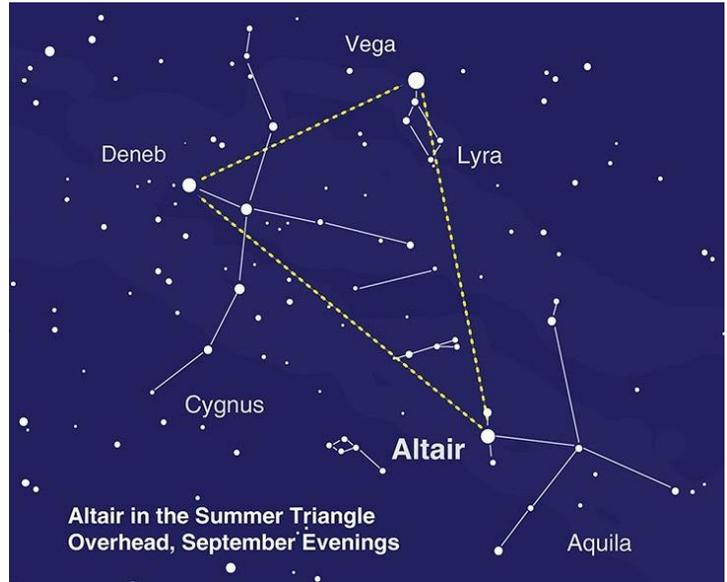
by David Prosper



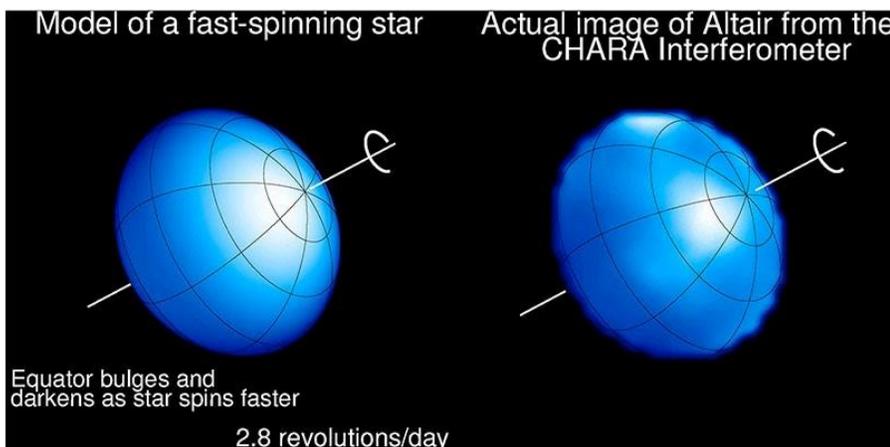
Altair is the final stop on our trip around the Summer Triangle! The last star in the asterism to rise for Northern Hemisphere observers before summer begins, brilliant Altair is high overhead at sunset at the end of the season in September. Altair might be the most unusual of the three stars of the Triangle due to its great speed; this star spins so rapidly that it appears “squished.”

A very bright star, Altair has its own notable place in the mythologies of cultures around the world. As discussed in our previous edition, Altair represents the cowherd Niulang in the ancient Chinese tale of the “Cowherd and the Weaver Girl.” Altair is the brightest star in the constellation of Aquila the Eagle; while described as part of an eagle by ancient peoples around the Mediterranean, it was also seen as part of an eagle by the Koori people in Australia! They saw the star itself as representing a wedge-tailed eagle, and two nearby stars as his wives, a pair of black swans. More recently, one of the first home computers was named after the star: the Altair 8800.

Altair is up high in the early evening in September. Note Altair’s two bright “companions” on either side of the star. Can you imagine them as a formation of an eagle and two swans, like the Koori?



Altair’s rapid spinning was first detected in the 1960s. The close observations that followed tested the limits of technology available to astronomers, eventually resulting in direct images of the star’s shape and surface by using a technique called interferometry, which combines the light from two or more instruments to produce a single image. Predictions about how the surface of a rapidly spinning massive star would appear held true to the observations. Models predicted a squashed, almost “pumpkin-like” shape instead of a round sphere, along with a dimming effect along the widened equator; the observations confirmed this. This equatorial dimming is due to a phenomenon called gravity darkening. Altair is wider at the equator than it is at the poles due to centrifugal force, resulting in the star’s mass bulging outwards at the equator. This results in the denser poles of the star being hotter and brighter, and the less dense equator being cooler and therefore dimmer. This doesn’t mean that the equator of Altair or other rapidly spinning stars are actually dark, but rather that the equator is dark in comparison to the poles. This is similar in a sense to sunspots. If you were to observe a sunspot on its own, it would appear blindingly bright, but it is cooler than the surrounding plasma in the Sun and so appears dark in contrast.



Model of fast spinning star and image of Altair created using optical interferometry (light from four telescopes was combined to produce image).

Credit: Ming Zhao, University of Michigan ([bit.ly/altairvsmodel](http://bit.ly/altairvsmodel))

As summer winds down, you can still take a Trip Around the Summer Triangle with this activity from the Night Sky Network. Mark some of the sights in and around the Summer Triangle at: [bit.ly/TriangleTrip](http://bit.ly/TriangleTrip).

Discover more about brilliant stars and their mysteries at [nasa.gov](http://nasa.gov).

# Phil Harrington's Cosmic Challenge

## Ring Nebula Central Star and Galaxy IC 1296

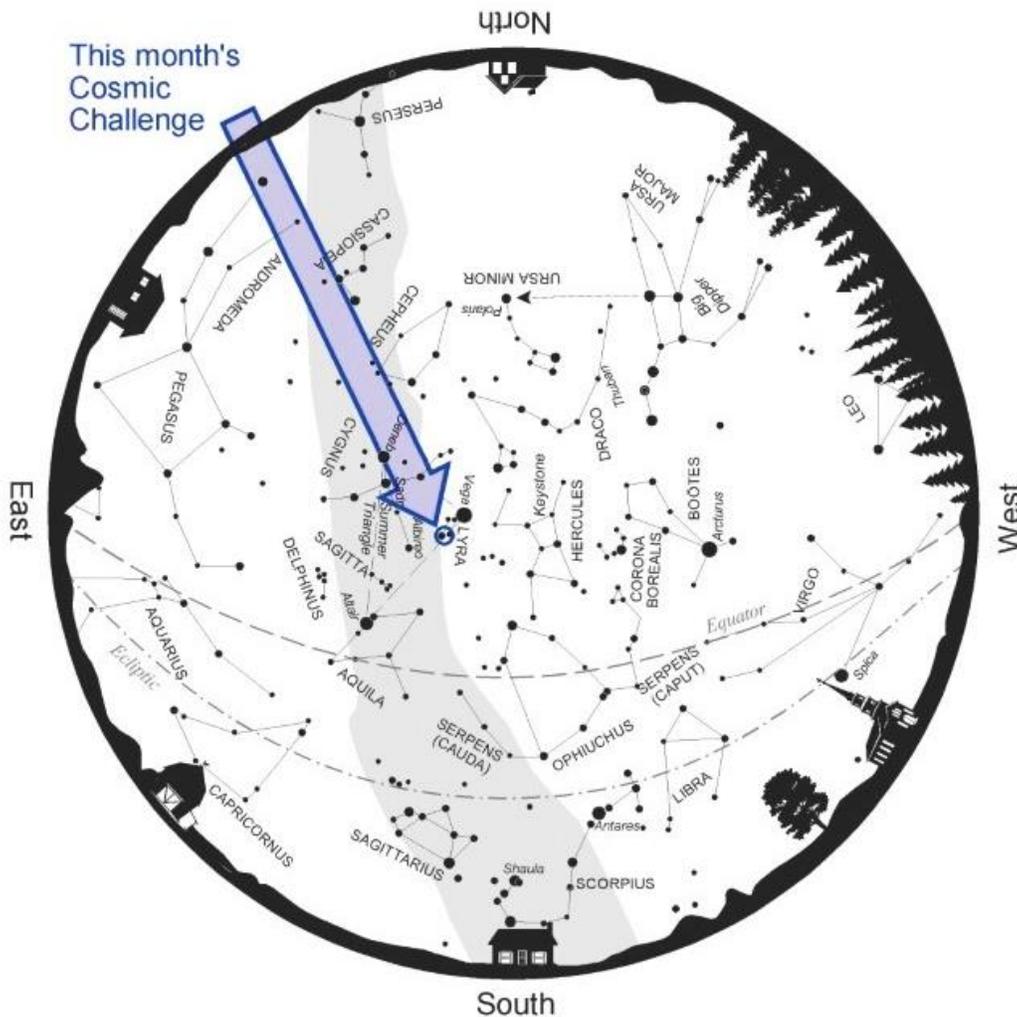


Monster scopes  
15 inch (38 cm) and larger

Target	Type	RA	DEC	Const.	Mag	Size
IC 1296	Galaxy	18h 53.3m	+33° 04.0'	Lyra	14.3	0.9' x 0.5'
M57 central star	Central star in planetary nebula	18h 53.6m	+33° 01.7'	Lyra	15.2	n/a

As we say goodbye to summer and get ready to welcome in autumn, I thought I would offer not one, but two challenges this month to bridge the seasonal change. Both appear right next to each other in our sky but are millions of light years apart. And both require all the aperture you can throw at them to be seen.

One of the classic challenges facing deep-sky observers at this time of year is spotting the Ring Nebula's central star, the progenitor sun that started it all some 6,000 to 8,000 years ago. Seeing the Ring's central star is one of those tests that every visual amateur needs to take at one point or another.

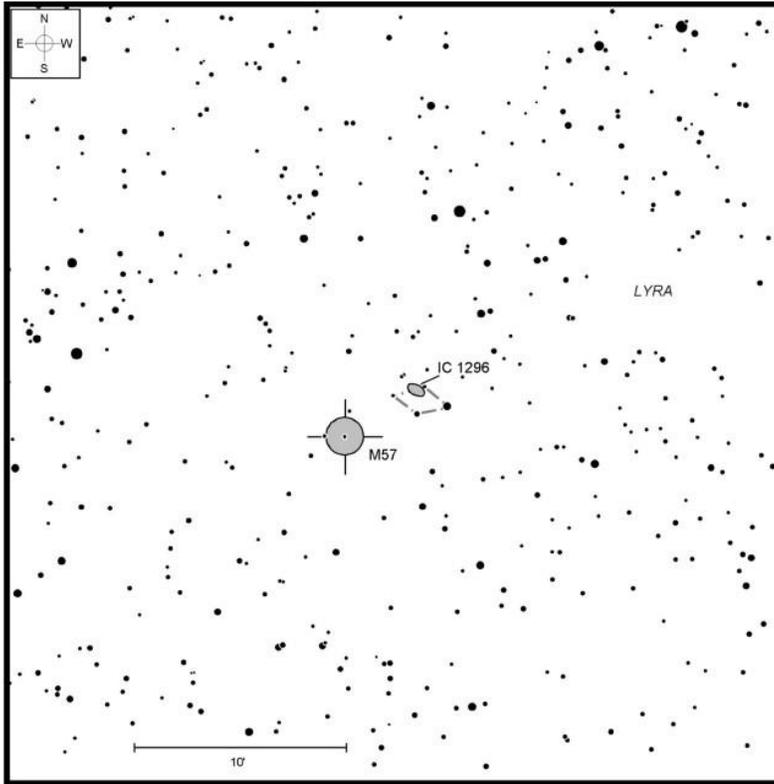


Summer star map adapted from [Star Watch](#) by Phil Harrington. This view Sept 1 at 7 pm.

Looking through observing handbooks, reading on-line deep-sky logs, speaking with friends and colleagues whom I consider to be seasoned veterans, and my own personal experience all seem to show that spotting the central star takes nothing short of "the perfect storm." Unless everything comes together just right, the star will remain hidden from view.

You might be wondering what all the fuss is about. After all, the star is listed as 15th magnitude, which is dim, but within the grasp of 15-inch (38 cm) telescopes, perhaps even less under dark, transparent skies. So why then is the central star so difficult through even the largest backyard scopes?

Here's an interesting observation that I have noticed time and again when trying to see the central star. It requires transparent skies, but not necessarily dark skies. Many amateurs equate one with the other, that dark skies are transparent skies, and vice versa. Not so.



(Left) Finder chart for this month's Cosmic Challenge adapted from [Cosmic Challenge](#) by Phil Harrington

From a stargazer's perspective, sky conditions can be divided into three categories: transparency, seeing, and sky darkness. "Transparency" refers to how clear the sky is, while "seeing" refers to the steadiness of the air mass overhead. Clouds, haze, humidity, and artificial and natural air pollutants all adversely affect both in different ways. Finally, "sky darkness" speaks to the ambient level of background light. Light pollution raises this level. People often confuse the terms transparency and sky darkness. It is certainly possible to have a city sky that is more transparent than a rural sky, but because of the lower level of sky darkness (due to urban light pollution), fainter stars will still be visible from the country site, even with its poorer transparency.

But to the topic here, I have seen the central star on several occasions through my 18-inch (46 cm) reflector from my naked-eye limiting magnitude 5 suburban backyard, but I have missed it entirely on many other occasions using the same equipment

from markedly darker sites. Why? Those other sites were darker (i.e., less light pollution), but the sky was not as transparent. That increased level of haze lowered the contrast between the star and the surrounding nebulosity just enough to mask the star.

That brings us to the second ingredient to seeing the star: seeing. Without steady seeing conditions, atmospheric turbulence will blur the star just enough to blend its already low-contrast glow into the Ring's donut hole. Without both conditions – transparency and exceptional seeing -- the central star will evade even the most careful search. But it still takes more than these. Your telescope's optics must be clean as well. Any contamination, notably skin oils on the eyepiece's lens, will be enough to lose the star.

(Right) M57's central star and galaxy IC 1296 as sketched through the author's 18-inch (46 cm) reflector. South is up in this portrayal.



Take a look at the amazing image of M57 and IC 1296 {on next page} posted by {Cloudy Nights} member [tolgagumus](#) in the [CCD/CMOS Astro Camera Imaging & Processing forum](#) back in September 2018. It's the culmination of almost 30 hours of data collection taken with a Planewave 14-inch (36cm) CDK modified Dall-Kircham scope and a Finger Lakes Instrumentation MLx694 CCD imager at DSW Remote Observatories in Rowe, New Mexico. You can read more details about the image by following the link back to the forum.



(Left) M57 and IC 1296.  
Image credit: CN member [tolgagumus](#)

A faint, far-off barred spiral galaxy floats in the same field as you try to eye the Ring's central star. Can you also spot IC 1296? It is a tougher task than its 14th-magnitude rating would imply. That's because, as we have seen so often before, the galaxy's surface brightness skews the integrated magnitude. In 15-inch-plus (38+ cm) telescopes, 14th-magnitude galaxies are fairly routine. That's assuming their light is concentrated evenly across their disk. In the case of IC 1296, the central hub of the galaxy is nearly stellar in appearance, while its broad spiral arms are unusually faint.

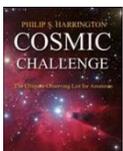
Back in August 2013, a Type-II supernova, SN2013ev, appeared in IC 1296. Even though it barely cracked 16th magnitude, it was actually easier to spot than its home galaxy because its feeble light was concentrated into a point source.

IC 1296 is just 4' northwest of M57, near a diamond of four 11th- to 14th-magnitude stars, as shown in the accompanying sketch and image. More specifically, it is positioned 20" southeast of the star at the diamond's northern facet. Proper magnification, in addition to dark skies and properly collimated optics, are key to spotting its dim glow.

I can probably count on one hand the number of times in the past half-dozen years when I have seen both of these challenges through my 18-inch (46cm) scope from my suburban backyard observatory. Summer haze, air turbulence, and light pollution quickly extinguish both. But on those rare evenings when the humidity is low, the seeing is calm, and the Ring is high in the sky, the elusive central star and its tiny galactic companion shine through. Indeed, under superior skies, telescopes as small as 10 inches (25cm) have shown both, so be sure to give it a go.

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](#) to learn more.

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## Dave Mitsky's Celestial Calendar

[Note from your Editor: I've re-arranged Mitsky's info a bit. I found two nifty gems buried in his data and decided to put them up front. Also, he didn't have any Sept B-days, but I found a site and listed them above in 'Currents' -LC]

This [Time & Date site](#) will display, for any given date/time, the apparent and comparative sizes of the planets, along with their magnitudes and distances!

Author [Phil Harrington](#) offers an excellent *freeware* planetarium program for binocular observers known as TUBA (Touring the Universe through Binoculars Atlas), which also includes information on purchasing binoculars!

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

- 9/1 The equation of time, which yields the difference between mean solar time and apparent solar time, equals 0 at 2:00
  - 9/2 Full Moon (known as the Barley, Corn, or Fruit Moon) occurs at 5:22; asteroid 2 Pallas is stationary at 13:00
  - 9/3 The Moon is 3.9 degrees southeast of Neptune at 1:00
  - 9/4 The Martian winter solstice occurs at 4:00
  - 9/6 The Moon is 0.03 degrees north of Mars, with an occultation occurring in southern Europe, northern Africa, Cape Verde Island, and central and northeastern South America, at 5:00; the Moon is at apogee, subtending 29' 28" from a distance of 405,607 kilometers (252,032 miles), at 6:29
  - 9/7 The Moon is 3.0 degrees south of Uranus at 4:00
  - 9/8 Mercury is at the descending node through the ecliptic plane at 18:00
  - 9/9 The Moon is 6.2 degrees southeast of the bright open cluster M45 (the Pleiades or Subaru) in the constellation of Taurus at 0:00; the Moon is 4.1 degrees north of the first-magnitude star Aldebaran (Alpha Tauri) at 18:00; Mars is stationary at 18:00
  - 9/10 Last Quarter Moon occurs at 9:26; the Moon is at the ascending node (longitude 85.2 degrees) at 23:00
  - 9/11 The Curtiss Cross, an X-shaped illumination effect located between the craters Parry and Gambart, is predicted to be visible at 00:32; asteroid 19 Fortuna (magnitude +9.4) is at opposition in the constellation of Pisces at 7:00; the Moon is 0.3 degrees south of the bright open cluster M35 in the constellation of Gemini at 13:00; Neptune (magnitude +7.8, angular size 2.3") is at opposition at 20:00
  - 9/13 Jupiter is stationary, with prograde (direct or eastward) motion to resume at 0:00; the Moon is 7.9 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 0:00; the Moon is 4.3 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 5:00; Venus is 2.3 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in the constellation of Cancer at 10:00
  - 9/14 The Moon is 2.1 degrees north-northeast of M44 at 5:00; the Moon, Venus, and M44 lie within a circle with a diameter of 4.4 degrees at 6:00; a double Galilean satellite shadow transit (Callisto's shadow follows Io's) begins at 6:57; the Moon is 4.4 degrees north-northeast of Venus at 7:00; Jupiter is at its southernmost declination at 20:00
  - 9/15 The Moon is 4.1 degrees north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 19:00
  - 9/16 The Sun enters the constellation of Virgo, at longitude 174.2 degrees on the ecliptic, at 14:00
  - 9/17 New Moon (lunation 1209) occurs at 11:00
  - 9/18 The Moon is at perigee, subtending 33' 17" from a distance of 359,082 kilometers (223,123 miles), at 13:48
  - 9/19 The Moon is 5.9 degrees north-northeast of Mercury at 3:00; Mercury is at aphelion (0.4667 astronomical units from the Sun) at 3:00; the Moon 6.4 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 10:00
  - 9/22 Mercury is 0.3 degrees northeast of Spica at 12:00; the Sun's longitude is 180 degrees at 13:31; the northern hemisphere autumnal equinox occurs at 13:31; the Moon is 5.8 degrees north-northeast of the first-magnitude star Antares (Alpha Scorpii) at 14:00
  - 9/23 The Moon is at the descending node (longitude 263.9 degrees) at 13:00
  - 9/24 First Quarter Moon occurs at 1:55; the Lunar X, also known as the Werner or Purbach Cross, an X-shaped clair-obscure illumination effect involving various ridges and crater rims located between the craters La Caille, Blanchinus, and Purbach, is predicted to be fully formed at 13:09
  - 9/25 The Moon is 1.6 degrees south of Jupiter at 7:00; the Moon is 2.3 degrees south of Saturn at 22:00
  - 9/26 Venus at ascending node through the ecliptic plane at 22:00
  - 9/29 Saturn is stationary, with prograde (direct or eastward) motion to resume, at 3:00
  - 9/30 Asteroid 68 Leto (magnitude +9.6) is at opposition in the constellation of Cetus at 3:00; the Moon is 3.9 degrees southeast of Neptune at 6:00
-

## On this date in history . . .

Sept 1, 1804: Karl Harding discovered asteroid 3 Juno.

Sept 7, 1746: Jean-Dominique Maraldi discovered the globular cluster M15.

Sept 9, 1892: E. E. Barnard discovered Jupiter's fifth satellite, fourteenth-magnitude Amalthea, using the 36-inch refractor at the Lick Observatory.

Sept 11, 1746: Jean-Dominique Maraldi discovered the globular cluster M2.

Sept 12, 1784: William Herschel discovered the barred spiral galaxy NGC 7753.

Sept 13, 1850: John Russell Hind discovered the asteroid 12 Victoria.

Sept 14, 1751: Nicolas-Louis de Lacaille discovered NGC 104 (47 Tucanae), the second largest and brightest globular cluster.

Sept 17, 1789: William Herschel discovered the Saturnian satellite Mimas.

Sept 19, 1848: William Bond discovered Saturn's fourteenth-magnitude satellite Hyperion, the first irregular moon to be discovered.

Sept 27, 1793: Comet C/1793 S2 (Messier) was discovered by Charles Messier.

Sept 23, 1846: Johann Gottfried Galle discovered Neptune using Urbain Le Verrier's calculations of its position.



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

The **Sun** is located in Leo on September 1st. It enters Virgo on September 16th. The Sun crosses the celestial equator from north to south at 13:31 UT on September 22nd, the date of the autumnal equinox.

The **Moon** is 12.7 days old, subtends 30.4 arc minutes, is illuminated 98.1%, and is located in Capricornus on September 1st at 0:00 UT. The Moon is at its greatest northern declination (+24.3 degrees) on September 12th and its greatest southern declination (-24.4 degrees) on September 25th. Longitudinal libration is at a maximum of +7.1 degrees on September 25th and a minimum of -7.2 degrees on September 13th. Latitudinal libration is at a maximum of +6.5 degrees on September 3rd and a minimum of -6.5 degrees on September 17th. Favorable librations for the following lunar features occur on the indicated dates: Crater Compton on September 1st, Vallis Bouvard on September 14th, Crater Oken on September 21st, and Crater Humboldt on September 22nd. Parts of the eastern limb like Mare Marginis and the craters Goddard and Neper will be visible due to a favorable libration beginning on September 19th. New Moon occurs on September 17th. Large tides will occur for several days thereafter. The Moon is at apogee (63.59 Earth-radii distant) on September 6th and at perigee (56.30 Earth-radii distant) on September 18th. The Moon occults Mars on September 6th from certain parts of the world.

**Mercury** lies low in the west and sets less than 50 minutes after sunset as the month ends. The waxing crescent Moon passes six degrees north of Mercury on September 19th. Mercury passes within 0.7 degrees of Spica on September 21st. The two very different celestial objects are only five degrees in altitude 20 minutes after the Sun sets.

During September, **Venus** attains an altitude of almost 40 degrees in the mid-northern latitudes. It rises at approximately 3:00 a.m. local daylight-saving time on September 1st. The brightest planet is located in Gemini as September begins, crosses through Cancer, and ends the month in Leo. Venus decreases in brightness from magnitude -4.3 to magnitude -4.1, decreases in apparent size from 19.5 arc second to 15.6 arc seconds, and increases in illumination from 60% to 71%. At the time that the waning crescent Moon passes four degrees north of Venus on the morning of September 14th, the planet lies 2.5 degrees south of the large open cluster M44 in Cancer.

**Mars** rises about two hours after sunset as September begins and culminates around 4:00 a.m. local daylight-saving time. It brightens from magnitude -1.8 to magnitude -2.5, making it a bit brighter than Jupiter, and increases in angular size from 18.9 arc seconds to 22.4 arc seconds this month. Mars attains a maximum altitude of almost 60 degrees from mid-northern latitudes in the United States. The waning gibbous Moon passes very close to the Red Planet on the morning of September 6th, with an occultation taking place in certain parts of the world. Mars reaches its first stationary point approximately five degrees north of the fourth-magnitude star Alrescha (Alpha Piscium) on September 9th and then begins a retrograde loop. Prominent Martian surface features visible at 2:00 a.m. local daylight-saving time include Syrtis Major and the Hellas basin in early September, Mare Sirenum and Mare Cimmerium during the second week of the month, the Tharsis Ridge and Olympus Mons at mid-month, Vallis Marineris during the third week in September, and Sinus Sabaeus and Sinus Meridiani at the end of the month.

**Jupiter** decreases in brightness to magnitude -2.4 and shrinks in angular diameter by 3.6 arc seconds this month. The gas giant reaches its second stationary point on September 13th. It then resumes prograde or eastward motion. The gap between Jupiter and Saturn that has grown by three degrees since May begins to close by month's end as Saturn also resumes eastward motion. The waxing gibbous Moon passes less than two degrees south of the Jupiter on September 25th. A double Galilean satellite shadow transit takes place on the morning of September 14th. Information on Great Red Spot transit times and Galilean satellite events is available on pages 50 and 51 of the September 2020 issue of Sky & Telescope, and browse [Sky and Telescope](#).

During September, **Saturn** fades from magnitude +0.3 to magnitude +0.5 and shrinks in apparent size from 18.0 arc seconds to 17.2 arc seconds. Saturn's rings span 40 arc seconds and are tilted 23 degrees with respect to the Earth. The waxing gibbous Moon passes two degrees south of the Ringed Planet on September 25th. Saturn reaches its second stationary point on September 29th and subsequently begins prograde or eastward motion. Eighth-magnitude Titan, Saturn's largest and brightest satellite, is due north of the planet on September 1st and September 17th and due south of it on September 9th and September 25th. Saturn's peculiar satellite Iapetus shines at almost eleventh magnitude on September 7th, when it passes 63 arc seconds due north of the planet. For information on Saturn's satellites, browse [Sky and Telescope](#).

**Uranus** is located in southwestern Aries, eleven degrees south of the second-magnitude star Hamal (Alpha Arietis). The planet is located 0.6 degrees southwest of the sixth-magnitude star 19 Arietis on September 1st. By the end of the month, Uranus is more than one degree from the star. The waning gibbous Moon passes three degrees south of Uranus on the morning of September 7th. A finder chart is available at [Naked Eye Planets](#).

**Neptune** can be found 2.5 degrees east of the fourth-magnitude star Phi Aquarii on the first day of September. The planet lies 1.5 degrees east of the star on September 30th. Neptune subtends 2.4 arc seconds, shines at magnitude +7.8, and lies at a distance of 4.0 light hours when it reaches opposition on September 11th. The Full Moon passes four degrees south of Neptune on September 1st. The waxing gibbous Moon passes four degrees south of the planet on the night of September 29th. An article on Neptune complete with finder charts appears on page 48 of the September 2020 issue of Sky & Telescope. See this [Naked Eye Planet site](#) for a finder chart.

The dwarf planet **Pluto** is located in the vicinity of the Teaspoon asterism in northeastern Sagittarius at a declination of more than -22.5 degrees. Finder charts can be found at pages 48 and 49 of the July 2020 issue of Sky & Telescope and on page 243 of the RASC Observer's Handbook 2020.

This month, for the first time in decades, four planets (**Venus, Mars, Jupiter, and Saturn**) are all nearly at their best.

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

**Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data** for the planets on September 1st:

Mercury (magnitude -0.6, 5.0", 92% illuminated, 1.34 a.u., Leo)  
Venus (magnitude -4.3, 19.5", 60% illuminated, 0.86 a.u., Gemini)  
Mars (magnitude -1.8, 18.9", 92% illuminated, 0.50 a.u., Pisces)  
Jupiter (magnitude -2.6, 44.3", 99% illuminated, 4.45 a.u., Sagittarius)  
Saturn (magnitude +0.3, 18.0", 100% illuminated, 9.24 a.u., Sagittarius)  
Uranus (magnitude +5.7, 3.7", 100% illuminated, 19.08 a.u. on September 16th, Aries)  
Neptune (magnitude +7.8, 2.4", 100% illuminated, 28.93 a.u. on September 16th, Aquarius)  
Pluto (magnitude +14.3, 0.1", 100% illuminated, 33.40 a.u. on September 16th, Sagittarius).

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](#).



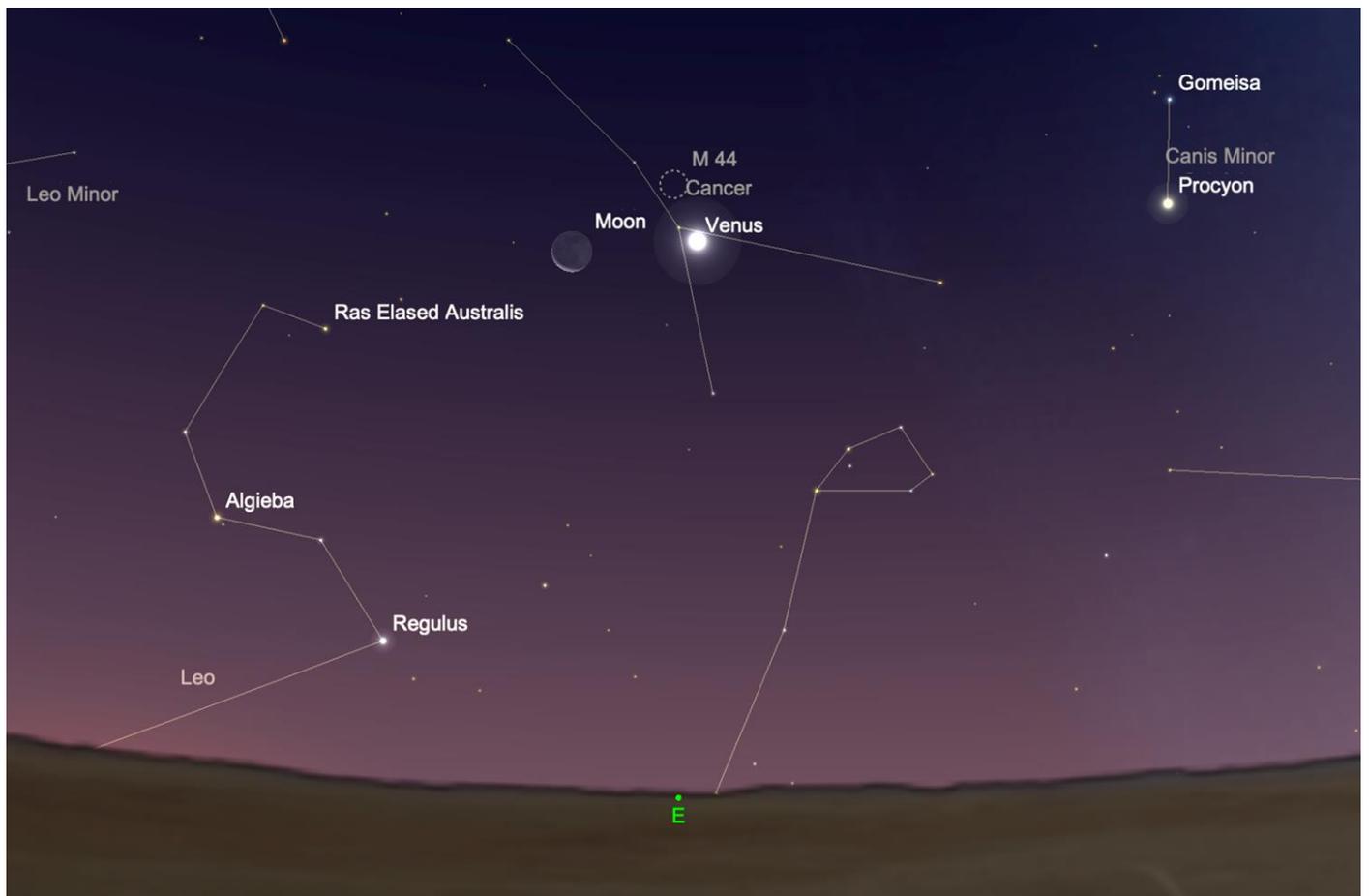
**Comet 88P/Howell** travels southeastward through Libra and Scorpius. It is at perihelion on Sept 26<sup>th</sup> and may reach a maximum brightness of approximately ninth magnitude. On Sept 4<sup>th</sup>, the periodic comet passes 14 arc minutes southwest of the eighth-magnitude globular NGC 5897 in Libra. It glides between the globular clusters M80 and M4 in Scorpius on the evenings of Sept 22<sup>nd</sup> through Sept 25<sup>th</sup>. Comet Howell passes approximately one degree north of Antares on the evenings of Sept 26<sup>th</sup> and 27<sup>th</sup>. Consult p. 49 of the Sept 2020 issue of *Sky & Telescope* for a finder chart.



**Asteroid (dwarf planet) 1 Ceres** shines at magnitude +7.7 as it heads southwestward between Aquarius and Piscis Austrinus this month. Asteroids brighter than magnitude +11.0 reaching opposition this month include 17 Thetis (magnitude +10.7) on Sept 9<sup>th</sup>, 22 Kalliope (magnitude +10.6) on Sept 10<sup>th</sup>, 19 Fortuna (magnitude +9.4) on Sept 11<sup>th</sup>, and 68 Leto (magnitude +9.6) on Sept 30<sup>th</sup>. Info on asteroid occultations in September is available at [Asteroid Occultations](#).

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

<https://www.cloudynights.com/topic/720687-august-2020-celestial-calendar/>



The Moon, Venus, and the Beehive star cluster at dawn in the eastern sky on September 14, 2020

*The End*

# 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 enjoyed our newsletter, from current news and celestial events to a cosmic challenge, and often a bit of space history. As a member, your contributions are welcomed and encouraged, either photos of the night sky or an article on astronomy. Contact the newsletter Editor for more information.

Membership entitles you to attend all monthly BAS Star Parties, educational outreach programs and, monthly membership meetings (often with a guest speaker). Owning a telescope is NOT a requirement of joining our club. Membership also includes, but is not limited to:

1. Membership in the Astronomical League ([www.astroleague.org](http://www.astroleague.org))
2. Discounts on subscriptions to both *Astronomy* and *Sky & Telescope* magazines
3. Star Party volunteer opportunities
4. Camping Star Party opportunities
5. First pick for campsite reservations at the annual Idaho State Party™
6. Field trips to area planetariums

Our membership meetings are normally held on the 2<sup>nd</sup> Friday of each month and, due to Covid-19, we now meet virtually via Zoom. Meetings often feature an interesting program or presentation, and the opportunity to spend time with other astronomy enthusiasts. Guests are welcome at our monthly Star Parties and meetings. We are always hoping they will become a member after attending our meetings.

### 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 often 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 do bring a telescope are more than happy to share their views. Star Parties may be planned around a specific celestial event or just on a clear, moonless night. Either way, observing together gives everyone an opportunity to 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 (includes all family members living at the same address) for the calendar year running from January 1 to December 31. Click [HERE](#) to print the membership application form.

Mail your application and check to us at: *(please make checks payable to Boise Astronomical Society)*

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

**NEW** - **Join & Pay Online** Click [HERE](#) (\$25 + \$1 process fee)

### Join us on Groups.io

We encourage you to 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, @boiseastro

