Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, December 12th 2015
7:00pm at the
Herrett Center for Arts & Science
College of Southern Idaho.

Public Star Party Follows at the Centennial Observatory

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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

Colleagues,

I hope you've had a Happy Thanksgiving, and that your Christmas and Holidays will be good ones.

When cold weather rolls around, it's tempting to shut down the astronomy. I'd invite you to find some way to keep in touch with the hobby/obsession/service you love so much. A couple of us went out to the Hagerman National Fossil Beds for a November star party and were rewarded with almost 30 visitors, proof that astronomy doesn't shut down after October.

This month, we can let astronomy go indoors. The annual MVAS Christmas Party will be Saturday, Dec. 12, at 7 p.m. in the Rick Allen room. Last year we started the new tradition of bringing a small gift of no more than $10 for a Christmas gift exchange, and we'll continue to enjoy the pot luck desserts and snacks as well.

Lastly, I want to take the time to thank you for all of your work and time this past year. We have had some rewarding activities, and hope to have some more next year. Stay tuned for more details on another planetarium visit, and check for an e-mail invite in the next couple of weeks regarding a MVAS-members only night at the Lodge at Castle Rocks State Park in March.

Clear Views,
Robert Mayer

Calendars for December

Event Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3 Last Quarter  49% Visible	4	5
6	7	8	9	10	11 New Moon  Lunation 1150	12 MVAS General Mtg. at the Herrett Center Public Star Party follows at the Centennial Observatory
13	14	15	16	17	18 First Quarter  49% Visible	19
20	21	22	23	24	25 Christmas  Full Moon (Long Night Moon Algonquin Nation)	26
27	28	29	30	31 New Year's Eve 		

Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month.

December Celestial Calendar and Trivia

All times are UT (subtract seven hours and, when appropriate, one calendar day)

12/4 Jupiter is 1.8° north of the Moon at 6:00; the Curtiss Cross, an X-shaped Clair-obscure illumination effect located between the craters Parry and Gambart, is predicted to occur at 19:08
12/5 The Moon is at apogee, subtending 29'46" from a distance of 404,800 kilometers (251,531 miles), at 14:57
12/6 Mars is 0.1° north of the Moon.
12/7 Venus is 0.7° south of the Moon, occultation visible from the Caribbean, Central America, & North America, at 17:00
12/8 The earliest sunset of the year at 40° north latitude occurs today.
12/9 Asteroid 16 Psyche (magnitude +9.4) is at opposition at 14:28
12/14 The peak of the Geminid meteor shower (100 to 120 per hour) occurs at 18:00
12/15 Mercury is at its greatest heliocentric latitude south today
12/17 Neptune is 3 degrees south of the Moon at 8:00
12/18 The Lunar X (the Purbach or Werner Cross), an X-shaped Clair-obscure illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to occur at 8:14;
12/20 Venus is at its greatest heliocentric latitude north today; Uranus is 1.2 degrees north of the Moon.
12/21 The Moon is at perigee, subtending 32'18" from a distance of 368,417 kilometers (228,924 miles), at 8:54
12/22 The shortest day of the year at 40 degrees north latitude occurs today; winter solstice in the northern hemisphere occurs at 4:48
12/23 The peak of the Ursid meteor shower (10 per hour) occurs at 2:00; the Moon is 0.6 degree north of the first-magnitude star Aldebaran (Alpha Tauri), with an occultation visible from northern Asia, Russia, Europe, northwestern Africa, and the eastern coast of Canada, at 20:00
12/25 Asteroid 27 Euterpe (magnitude +8.4) is at opposition at 5:36; Full Moon (known as the Before Yule, Cold, Long Nights, and Oak Moon) occurs at 11:11
12/26 Uranus is stationary at 11:00
12/29 Mercury is at greatest eastern elongation (20 degrees) at 3:00
12/31 Jupiter is 1.5° north of the Moon at 18:00

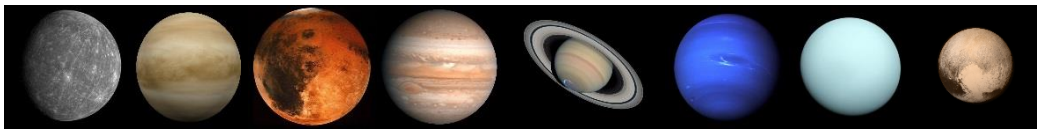
Tycho Brahe, Johannes Kepler, Isaac Newton, and Arthur Eddington were born in December.

Giovanni Cassini discovered the Saturnian satellite Rhea on December 23, 1672.

Information on Iridium flares and passes of the ISS, the Tiangong-1, the X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/

Challenge deep-sky object for December: Van den Berg **VdB 14**(Camelopardalis) (pictured above) is an elliptically-shaped, blue reflection nebula in Camelopardalis near **VdB** 15 and Shrapless 2-202 emission nebula.

The Planets



During the evening, Mercury can be found in the southwest, Uranus in the southeast, and Neptune in the south. Jupiter is the east and Uranus is in the west at midnight. In the morning, Venus, Mars, and Saturn are located in the southeast and Jupiter is located in the south.

At midmonth, Mercury is visible during evening twilight, Venus rises at 4:00 a.m. local time, Mars rises at 2:00 a.m. local time, Jupiter rises at midnight and transits at 6:00 a.m. local time, and Saturn is visible during morning twilight for observers at latitude 40 degrees north.

Mercury is visible low in the southwestern evening sky from December 7th through December 31st. It's at its greatest heliocentric latitude south on December 15th. Greatest eastern elongation takes place on December 29th UT. Mercury sets about an hour after the Sun on that date.

Venus is occulted by the waning gibbous Moon during daylight on the afternoon of December 7th. The brightest planet crosses into Libra on December 11th. Venus is at its greatest heliocentric latitude north on December 15th. It lies two degrees north of the third-magnitude star Zubenelgenubi (Alpha Librae) on December 17th.

Mars is occulted by the Moon on December 6th. The Red Planet is four degrees north of the first-magnitude star Spica on December 21st.

In early December, Jupiter rises at approximately 12:30 a.m. local time. The gas giant is 1.8 degrees north of the Moon on December 4th. By the end of the month, Jupiter rises around 11:30 p.m. local time. It shines at magnitude -2.2 and spans nearly 39 arc seconds at that time.

Saturn reappears low in the morning sky in mid-December. The Ringed Planet is situated a bit more than six degrees to the north of the first-magnitude star Antares on December 21st.

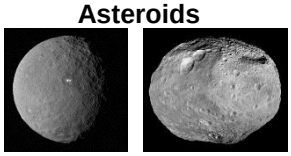
Uranus is located two degrees due south of the fourth-magnitude star Epsilon Piscium for the entire month. It is occulted by the Moon on December 20th. Uranus is stationary and then resumes direct or prograde (eastern) motion on December 26th.

Neptune lies 1.5 degrees northeast of the fifth-magnitude star Sigma Aquarii on December 1st and 2.0 degrees northeast of that star on December 31st. The eighth planet sets before 9:00 p.m. local time by the end of the month.

See http://www.curtrenz.com/uranep.html for additional information on Uranus and Neptune.

The dwarf planet Pluto will not be visible again until next year.

Asteroids



During December, asteroid 29 Laetitia glides northwestward through Cetus. The tenth-magnitude minor planet lies very close to the spiral galaxy M77 on the nights of December 9th and December 10th. On the night of December 16th, it passes between the spiral galaxy NGC 1055 and the fourth-magnitude star Delta Cygni. The following asteroids brighter than magnitude +11.0 reach opposition this month: 16 Psyche (magnitude +9.6) on December 9th and 27 Euterpe (magnitude +8.4) in on December 25th.

Comets

Comet C/2013 US10 (Catalina) Comet C/2013 US10 (Catalina) may shine at fourth magnitude in early December as it travels northward through Virgo and eventually through Bootes.

Comet 22P/Kopff begins the month in southeastern Ophiuchus, 3° northeast of 3rd-magnitude Theta Ophiuchi. From there, it heads east through Sagittarius, passing 15' south of the Trifid Nebula (M20) on the evening of December11, and 45' north of the globular star cluster M22 on December21. Make sure the comet is near the top of your observing list because it sinks quickly into the southwestern horizon haze after darkness falls. Once you track it down, boost your telescope's power past 100x to darken the sky further and increase the contrast.

Meteors

December 14th's Geminid meteor shower is not affected by moonlight this year. The Geminids, which are associated with the Palladian asteroid, or possible cometary nucleus, 3200 Phaethon, have become the most reliable meteor shower of the year. Geminid meteors appear to originate from a radiant that's just northwest of Castor (Alpha Geminorum). That radiant lies almost at the zenith at 2:00 a.m. local time. An article on the 2015 Geminids appears on page 44 of the December issue of Sky & Telescope. The Ursids, a normally minor meteor shower, peak on the evening of December 22nd DST. Moonlight from a waxing gibbous Moon will interfere with observing the shower. The radiant is located close to Kochab (Beta Ursa Minoris), some 15 degrees from the north celestial pole.

Carbon Star

U Camelopardalis Right Ascension: $03^{h}\ 41^{m}\ 48.17393^{s}$ / Declination: +62° 38′ 54.3906″

The Deep Sky

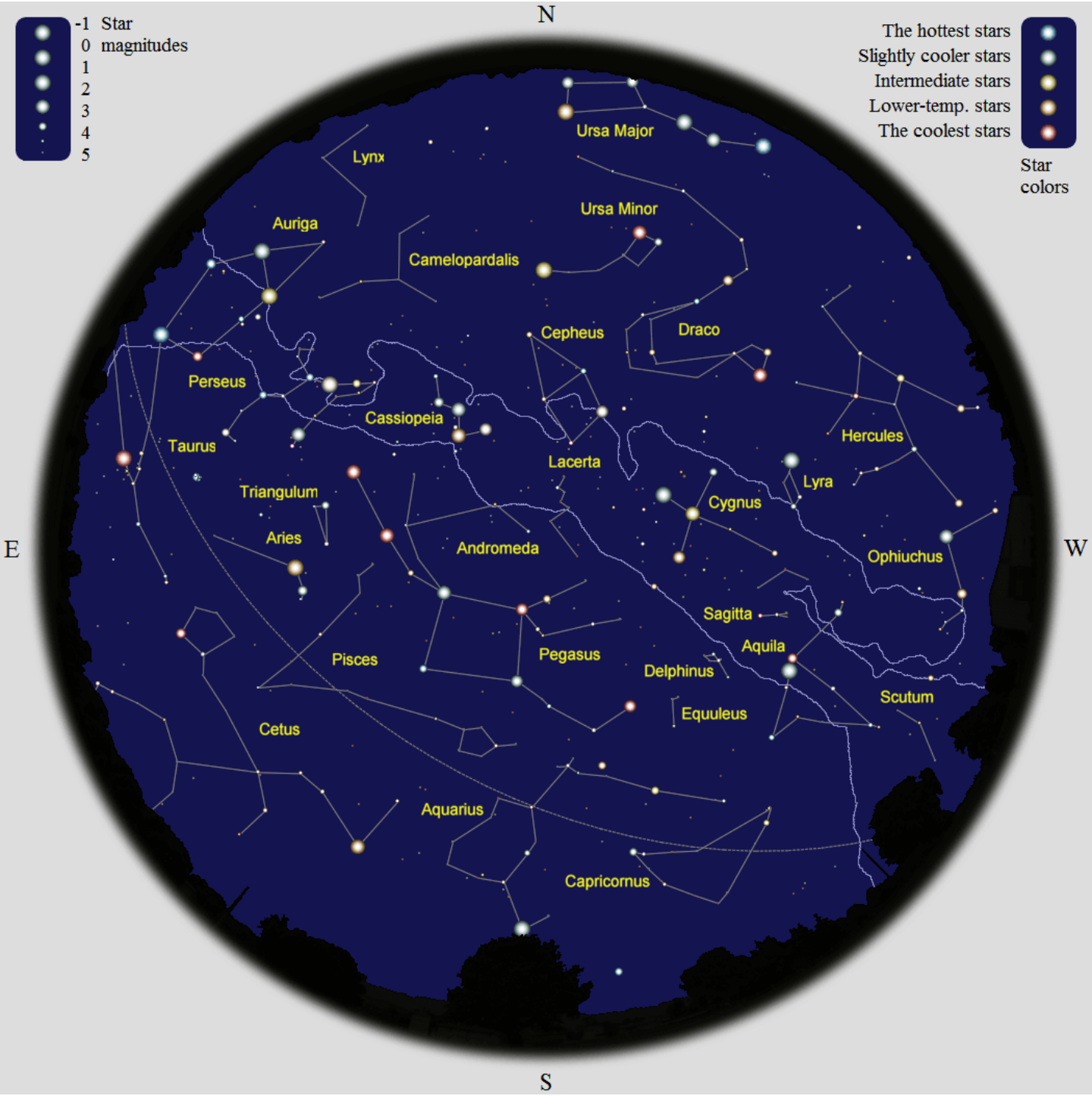
Top ten binocular deep-sky objects for December: M34, M45, Mel15, Mel20, NGC 869, NGC 884, NGC 1027, NGC 1232, St2, St23

Top ten deep-sky objects for December: M34, M45, M77, NGC 869, NGC 884, NGC 891, NGC 1023, NGC 1232, NGC 1332, NGC 1360

The objects listed above are located between 2:00 and 4:00 hours of right ascension.

A wealth of information on solar system celestial bodies is posted at http://www.curtrenz.com/astronomical

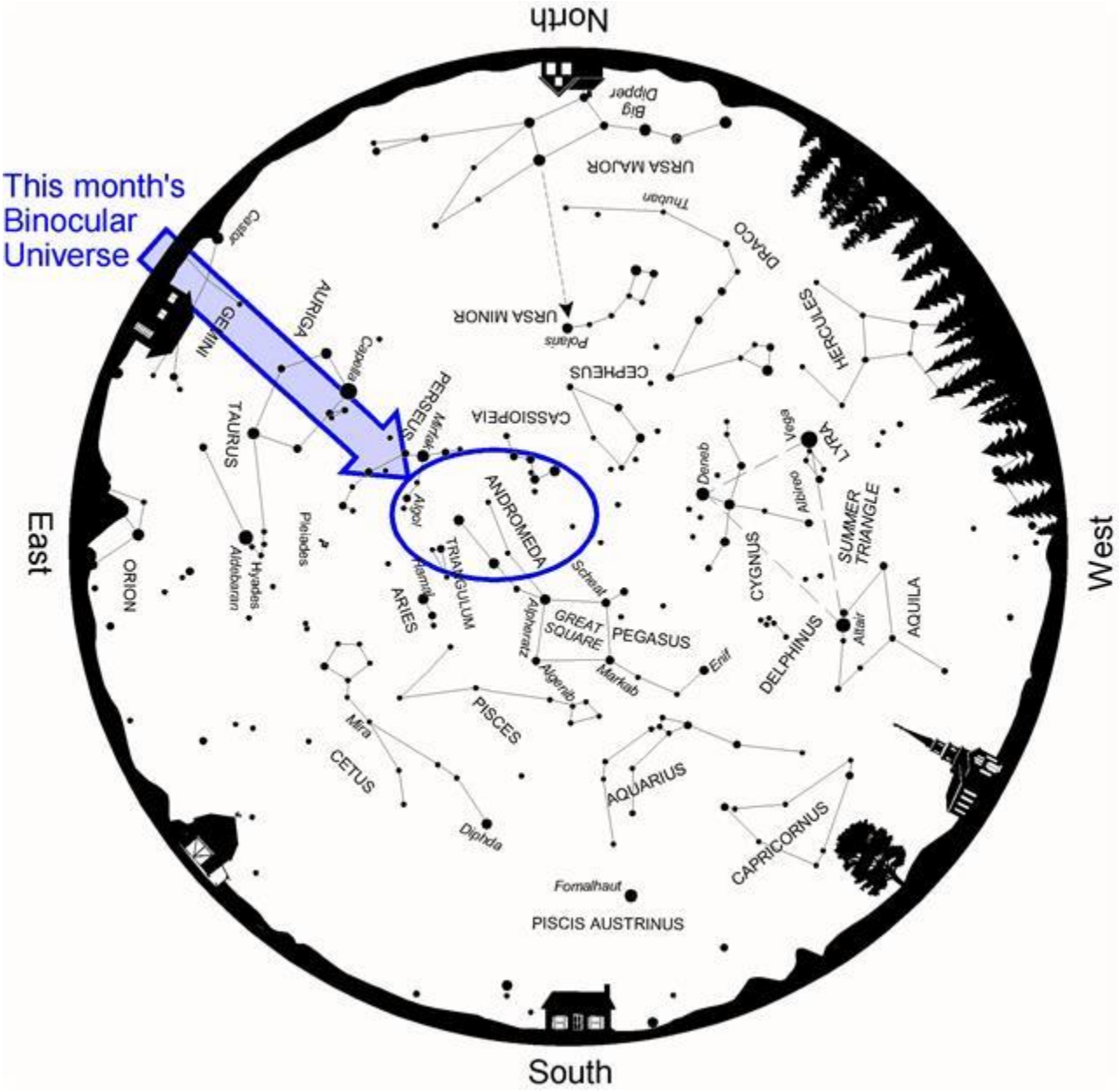
Planisphere for December



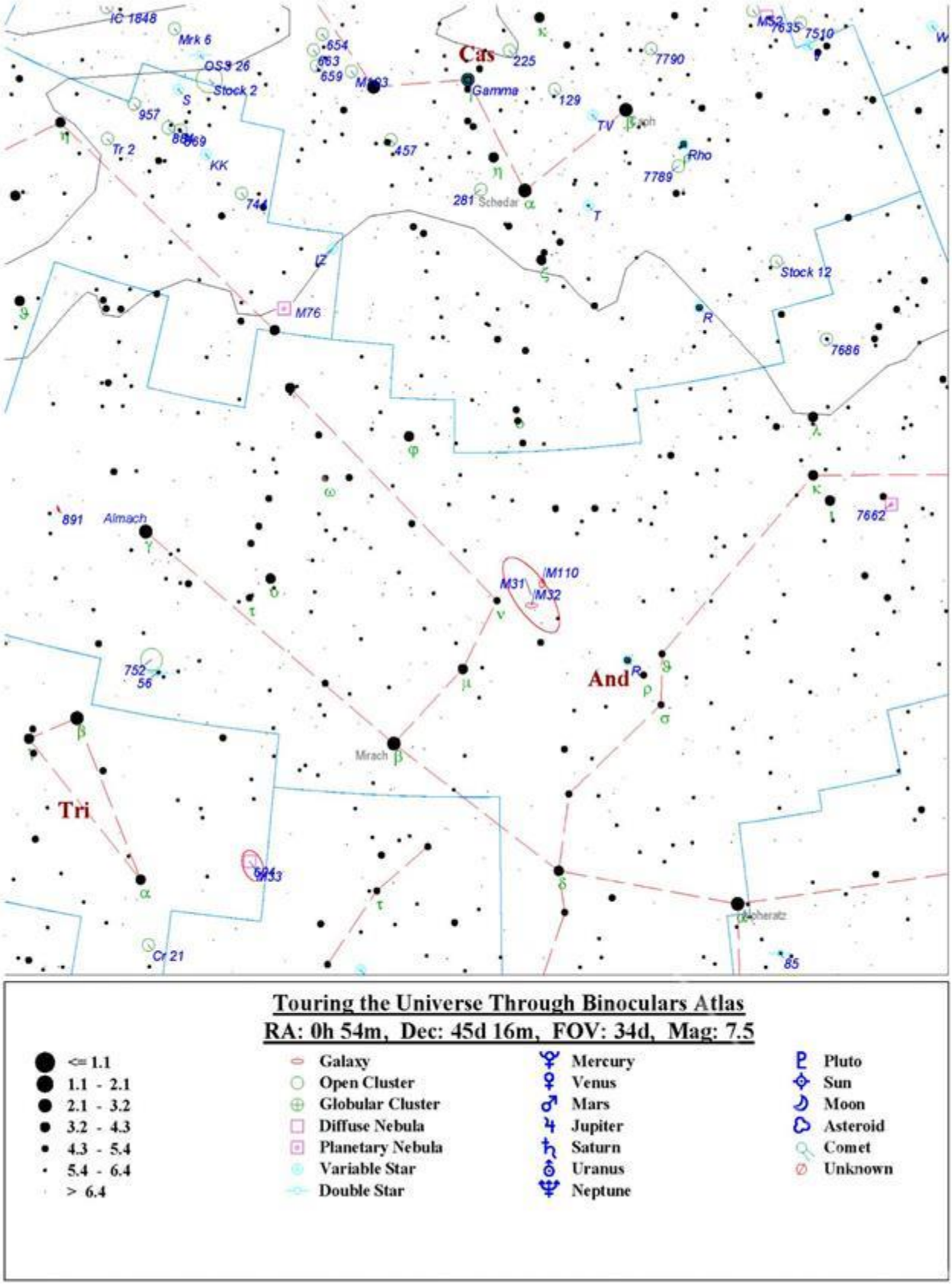
Be Safe – Get Out There – Explore Your Universe

Binocular Universe: Hunting Big Game!

Over the last few months, we have explored planetary nebulae and galaxies hidden in the far southern sky. This month, we head back north to tackle others gracing the December sky that are sure test your mettle. Be forewarned, as the title of this installment says, we are going after some big game.



Above: Autumn star map from Star Watch by Phil Harrington.
Click the chart to open a printable PDF version in a new window.



Touring the Universe Through Binoculars Atlas

RA: 0h 54m, Dec: 45d 16m, FOV: 34d, Mag: 7.5

<= 1.1	Galaxy	Mercury	Pluto
1.1 - 2.1	Open Cluster	Venus	Sun
2.1 - 3.2	Globular Cluster	Mars	Moon
3.2 - 4.3	Diffuse Nebula	Jupiter	Asteroid
4.3 - 5.4	Planetary Nebula	Saturn	Comet
5.4 - 6.4	Variable Star	Uranus	Unknown
> 6.4	Double Star	Neptune	

Above: Finder chart for this month's Binocular Universe.
Chart adapted from **Touring the Universe through Binoculars Atlas** *(TUBA)*
Click the chart to open a printable PDF version in a new window.

Our first target is no less than **M76**, the Little Dumbbell Nebula in Perseus. This is a real toughie, and probably only in the realm of giant binoculars 70mm and more in aperture and 16x or more magnification. That's because this planetary nebula shines at only 10th magnitude (some references say it's as faint as 12th magnitude, but we'll be optimistic) and tiny! That makes it one of the faintest Messier objects.

Here's how I have found it in my 16x70s, by using the stars of Andromeda as a guide. Scan along the Princess's stars northeastward from Alpheratz, the star marking the northeast corner of the Great Square, pass Mu Andromedae, to 51 Andromedae and Phi Persei, a pair of dim naked-eye points. Aim toward Phi, where you should see it and a dim, orange star immediately to its north. M76 completes a right triangle with these two stars, the orange sun marking the right angle itself.

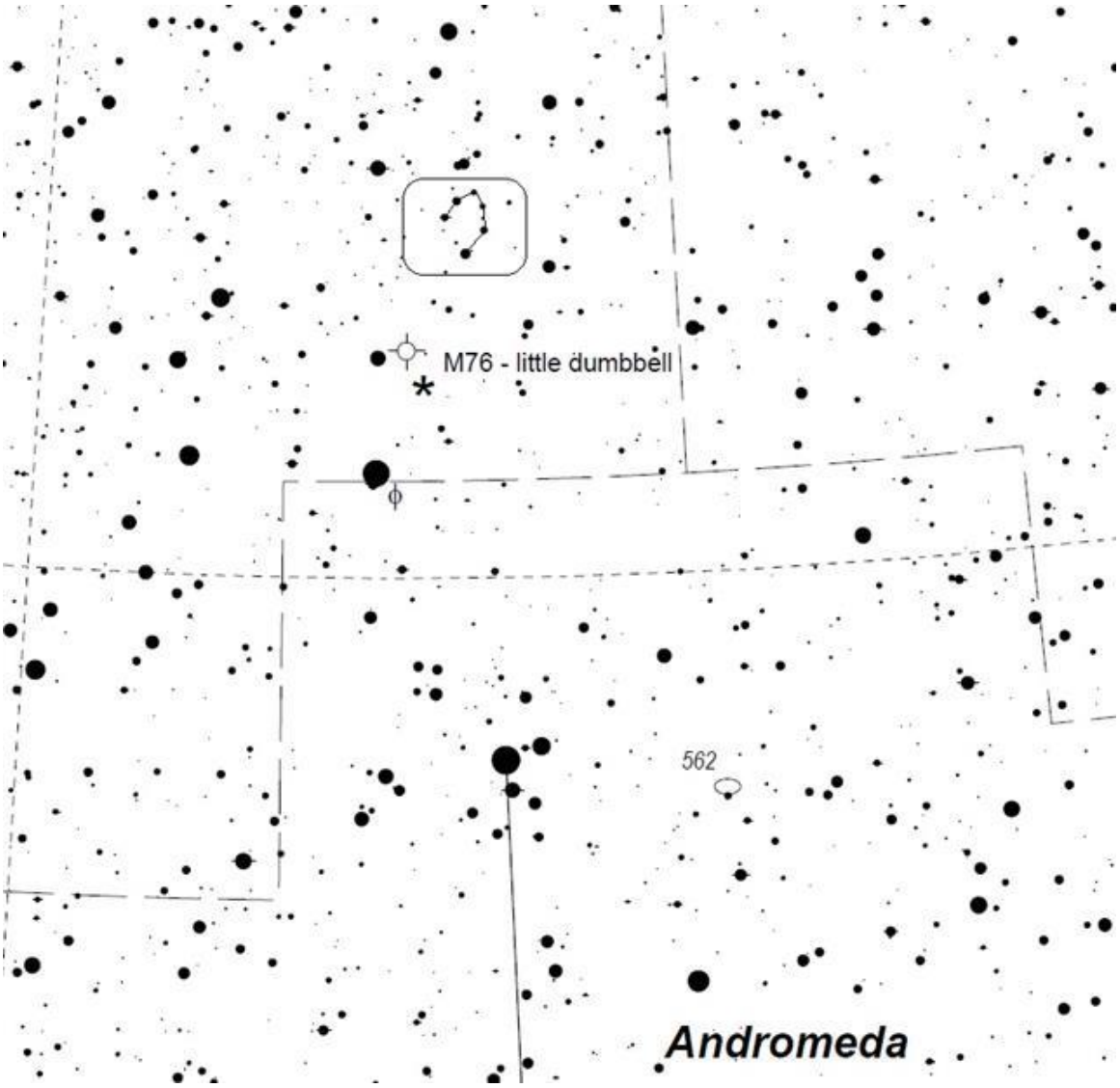
Those 16x70s show M76 as a tiny, faint point of fuzzy light, which at first glance may look like an ordinary star. Moving up to my 25x100s, this so-called star "just doesn't look right." Instead, it looks slightly elongated approximately north-to-south. Some observers remark that it looks just like a celestial peanut!

Discovered by Pierre Mechain in 1780, M76 is a classic example of what astronomers call a bipolar planetary nebula. In these nebulae, it is believed that a disk of obscuring dust not only hides the central star from view, but also channels material into two exhaust plumes rather than streaming away evenly. The result is a planetary nebula that appears to blossom much as a butterfly extends its two wings, which has led some to call them "butterfly" planetary nebulae. This two-part appearance also led to M76 being assigned two entries, NGC 650 and NGC 651, in the New General Catalog.

The distance to M76, like many planetary nebulae, is not well established. Estimates place it about 3,400 light years away, although published values range anywhere between 1,700 and 15,000 light years. If we accept the distance of 3,400 light years, then M76 spans about 4.5 light years.

As I mention in my book Star Watch, it's interesting to point out an important lesson here for all observers. Nearby M33, the Triangulum Spiral, is listed in most references as 6th magnitude, which sounds as though it should be fairly bright and easy to find. It is neither. Now, contrast that with M76, listed at magnitude 10-ish. Should be faint, right? While it is, many observers report that M76 is actually easier to find than M33! Why? The answer is "surface brightness." M76 has a brighter surface than M33, and is therefore actually easier to see. The point of all this is never be misled by an object's listed magnitude. In some cases, the listed magnitude makes an object sound much brighter than it actually appears, while in others, it misleads observers into thinking that an object is fainter.

As I was preparing to submit this installment for publication, I received an e-mail from a reader, Scott Harrington (no relation, that I know of anyway!). He wrote that while trying to view M76 through his 8x56 binoculars, he stumbled upon a curious asterism of six 8th- and 9th-magnitude stars that collectively look just like a horseshoe. It measures about 30 arc-minutes across and lies a few degrees north of M76. He explained further that "I have to figure it must have fallen off Pegasus as he flies through the sky!" I love it. Scott e-mailed both me and Sue French to see if either of us had ever seen or heard of it before. Neither of us has. It's also not listed in the latest version of the Saguaro Astronomy Club's extensive database of asterisms. So, good for you, Scott! Let's call it **Harrington's Horseshoe**, but to be very clear, that's SCOTT HARRINGTON, not me.



Above: This chart, created and provided by Scott Harrington, shows the location of his Horseshoe asterism with respect to M76. North is up.

If M76 was a bit much, then try your luck with Andromeda's **NGC 7662**, nicknamed The Blue Snowball. NGC 7662 lies in the western portion of the constellation. Scan the area for three 4th-magnitude stars: Lambda, Kappa, and Iota Andromedae. They a bent row lined up roughly north-to-south, some 16 degrees north-northwest of Alpheratz (Alpha Andromedae), the star shared by Andromeda and the Great Square of Pegasus. From Iota at the southern end of that row, you should spot 6th-magnitude 13 Andromedae about 2 degrees further west. NGC 7662 awaits less than half a degree to 13's south-southwest. While it will appear stellar through binoculars, its blue-green tint should make it identifiable among the other, mostly white stars. Defocusing ever so slightly often enhances its soft coloring.

On our way to M76, we passed north of the star **Almach** (Gamma Andromeda). To the naked eye and handheld binoculars, Almach looks like a single star. But with high magnification, its true nature begins to show. Turning my 25x100s its way, I see what German physicist Johann Tobias Mayer discovered in 1778, that Almach is a binary star. And not just any binary star, but one of the most colorful pairings in the entire sky. The brighter in the pair, Gamma-1, is a yellow star, while its fainter partner, Gamma-2, is blue. Some 10 arc-seconds separate them.

Can binoculars resolve a pair of stars that close? It all comes down to magnification. The resolving ability of a telescope is dictated by aperture, assuming quality optics. The low magnification of binoculars, however, usually makes magnification more of the determining criterion. Assuming the observer has 20/20 vision, the minimum resolution value for a given pair of binoculars can be estimated by dividing its magnification into 240. Using this, we find that a pair of 10x binoculars has a resolution threshold of 24 arc-seconds, while 20x binoculars can resolve 12 arc-seconds, and so on. I can make out the duality of Gamma Andromedae in my 25x monsters, but not in my 16x pair. How about you? Can you better the "240 Rule?"

I've saved the toughest for last. **NGC 891** in Andromeda is probably the most photographed edge-on spiral galaxy in the entire sky. But it's very difficult to see visually, especially through common binoculars. To give it a go, look for it just 3.5 degrees east of Almach. That's where William Herschel was looking on October 6, 1784, when he discovered this gem. As we gaze toward NGC 891, we are seeing what our own Milky Way would look like from a sideways vantage point 30 million light years away. Like our galaxy, NGC 891 shows a pronounced central bulge and a distinctive opaque lane of cosmic dust encircling its outer perimeter. Those distinguishing features, so clear in photographs, remain hidden through binoculars. Indeed, simply find NGC 891 is difficult enough. It shines at 10th magnitude, but the fact that its light is spread over a thin, 13'x3' profile, which is then further diminished by the dark dust lane running its length, greatly complicates things. For me, it takes the magnification and light-gathering prowess of my 25x100s to confirm it. But maybe you can do better!

Now if all this has proven just too difficult, take heart. Notice what is centered on this month's chart? None other than **M31**, the Andromeda Galaxy! I can't possibly talk about all the difficult targets scattered in this part of the sky and ignore this magnificent spiral. Swing your binoculars its way and you'll immediately see a soft, oval blur highlighted by a prominent core. Only the central part is bright enough to pierce severe light pollution, but from a dark location, the full span of the broad spiral-arm disk becomes visible. M31 spreads its arms a full 5° -- that's as wide as ten Full Moons stacked end to end! Also keep an eye out for its two neighbors, dwarf elliptical galaxies **M32** and **M110**. M32, the smaller and brighter of the pair, is a visible as a small, almost stellar patch of light due south of M31's core. M110 is larger, but fainter, and therefore more difficult to see. Look for it to the north of M31's core, about twice as far as M32. M32 looks almost perfectly circular, while M110 appears more oblate.

As you can see from the list below, there are many other targets in this corner of the late autumn/early winter sky to explore tonight with your binoculars. Some are easy to see, some are hard. Why not give each a try?

Object	Con	Type	R.A. (2000)	Dec	Mag	Size/Sep/ Period	Notes
R	And	Vr	0 24	+38 35	5.8-14.9	409.33 days	Long Period Variable
M110	And	Gx	0 40.4	+41 41	8.0	17'	*TUB page 87* E6 NGC 205 M31 companion
M32	And	Gx	0 42.7	+40 52	8.2	8'x6'	*TUB page 86-87* E2 NGC 221 M31 compani
M31	And	Gx	0 42.7	+41 16	3.5	160'x40'	*TUB page 86* Sb NGC 224 Andromeda Gal
56	And	**	1 56.2	+37 15	5.7,6.0	190"	300°(1928);1534
752	And	OC	1 57.8	+37 41	5.7	50'	*TUB page 87*
891	And	Gx	2 22.6	+42 21	10.0	14'x3'	Sb; Edge-on
7662	And	PN	23 25.9	+42 33	8.9p	32"x28"	*TUB page 87-88*
7686	And	OC	23 30.2	+49 8	5.6	15'	
TV	Cas	Vr	0 19.3	+59 8	7.2-8.2	1.813 days	Eclipsing Binary
T	Cas	Vr	0 23.2	+55 48	6.9-13.0	444.83 days	Long Period Variable
129	Cas	OC	0 29.9	+60 14	6.5	21'	*TUB page 114*
225	Cas	OC	0 43.4	+61 47	7.0	12'	
281	Cas	OC	0 52.8	+56 37	7.4p	23'x27'	
Gamma	Cas	Vr	0 56.7	+60 43	1.6-3.0		*TUB page 114* Irr; Gamma Cas prototype
457	Cas	OC	1 19.1	+58 20	6.4	13'	*TUB page 114* Owl Cluster
M103	Cas	OC	1 33.2	+60 42	7.4	6'	*TUB page 114* NGC 581
654	Cas	OC	1 44.1	+61 53	6.5	5'	
659	Cas	OC	1 44.2	+60 42	7.9	5'	
663	Cas	OC	1 46	+61 15	7.1	16'	
Stock 2	Cas	OC	2 15	+59 16	4.4	60'	*TUB page 114-115* Muscleman Cluster
OSS 26	Cas	**	2 19.7	+60 2	6.9,7.4	63"	200°(1925)
Mrk 6	Cas	OC	2 29.6	+60 39	7.1	4.5'	
IC 1848	Cas	OC	2 51.2	+60 26	6.5	12'	
V	Cas	Vr	23 11.7	+59 42	6.9-13.4	228.83 days	Long Period Variable
7635	Cas	DN	23 20.7	+61 12		15'x8'	Bubble Nebula
M52	Cas	OC	23 24.2	+61 35	6.9	13'	*TUB page 115* NGC 7654
Stock 12	Cas	OC	23 37.2	+52 26		20'	
Rho	Cas	Vr	23 54.4	+57 30	4.1-6.2	320 days	Semi-Regular
7789	Cas	OC	23 57	+56 44	6.7	16'	*TUB page 115*
R	Cas	Vr	23 58.4	+51 24	4.7-13.5	430.46 days	Long Period Variable
7790	Cas	OC	23 58.4	+61 13	8.5	17'	
W	Cep	Vr	22 36.5	+58 26	7.0-9.2		Semi-Regular
7510	Cep	OC	23 11.5	+60 34	7.9	4'	
85	Peg	**	0 2.2	+27 5	5.8,8.6	76"	330°(1932);17175;Rapid
IZ	Per	Vr	1 32.1	+54 1	7.8-9.0p	3.688 days	Eclipsing Binary
744	Per	OC	1 58.4	+55 29	7.9	11'	
KK	Per	Vr	2 10.3	+56 34	6.6-7.8		Irregular
869	Per	OC	2 19	+57 9	4.3	30'	*TUB page 199-200* Double Cluster (h Per)
884	Per	OC	2 22.4	+57 7	4.4	30'	*TUB page 199-200* Double Cluster (Chi Per
S	Per	Vr	2 22.9	+58 35	7.9-11.5		Semi-Regular
957	Per	OC	2 33.6	+57 32	7.6	11'	
Tr 2	Per	OC	2 37.3	+55 59	5.9	20'	*TUB page 200-201*
RT	Psc	Vr	1 13.8	+27 8	8.2-10.4p	70 days	Semi-Regular
M33	Tri	Gx	1 33.9	+30 39	6.3	60'x35'	*TUB page 240-241* NGC 598 Sc
604	Tri	DN	1 34.5	+30 48			*TUB page 242* In M33
Cr 21	Tri	OC	1 50.1	+27 15	8.2p	6'	*TUB page 242* Putter Cluster

So, until next year, tell your friends that for stargazing, two eyes are better than one.

About the Author: Phil Harrington is a contributing editor to Astronomy magazine and author of 9 books on astronomy. Last month, his first book, Touring the Universe Through Binoculars, just marked 25 years in print. Visit his web site at www.philharrington.net to learn more. This article was reprinted with permission of the author.

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Our Solar System Is *Almost* Normal, But Not Quite by Ethan Siegel

It was just over 20 years ago that the very first exoplanet was found and confirmed to be orbiting a star not so different from our own sun. Fast forward to the present day, and the stellar wobble method, wherein the gravitational tug of a planet perturbs a star's motion, has been surpassed in success by the transit method, wherein a planet transits across the disk of its parent star, blocking a portion of its light in a periodic fashion. Thanks to these methods and NASA's Kepler spacecraft, we've identified many thousands of candidate planets, with nearly 2,000 of them having been confirmed, and their masses and densities measured.

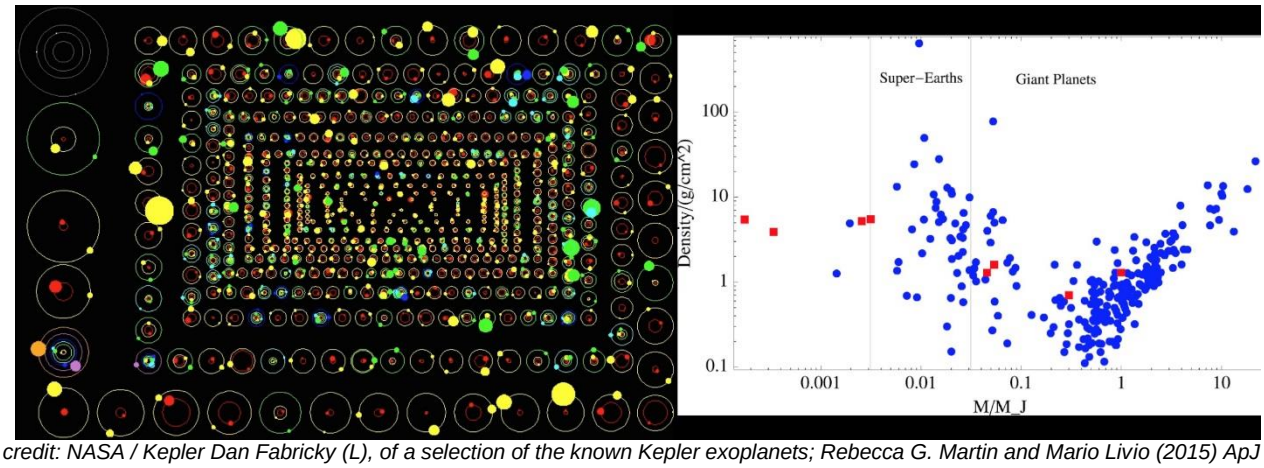
The gas giants found in our solar system actually turn out to be remarkably typical: Jupiter-mass planets are very common, with less-massive and more-massive giants both extremely common. Saturn—the least dense world in our solar system—is actually of a fairly typical density for a gas giant world. It turns out that there are many planets out there with Saturn's density or less. The rocky worlds are a little harder to quantify, because our methods and missions are much better at finding higher-mass planets than low-mass ones. Nevertheless, the lowest mass planets found are comparable to Earth and Venus, and range from just as dense to slightly less dense. We also find that we fall right into the middle of the "bell curve" for how old planetary systems are: we're definitely typical in that regard.

But there are a few big surprises, which is to say there are three major ways our solar system is an outlier among the planets we've observed:

All our solar system's planets are significantly farther out than the average distance for exoplanets around their stars. More than half of the planets we've discovered are closer to their star than Mercury is to ours, which might be a selection effect (closer planets are easier to find), but it might indicate a way our star is unusual: being devoid of very close-in planets.

All eight of our solar system's planets' orbits are highly circular, with even the eccentric Mars and Mercury only having a few percent deviation from a perfect circle. But most exoplanets have significant eccentricities, which could indicate something unusual about us. And finally, one of the most common classes of exoplanet—a super-Earth or mini-Neptune, with 1.5-to-10 times the mass of Earth—is completely missing from our solar system.

Until we develop the technology to probe for lower-mass planets at even greater distances around other star systems, we won't truly know for certain how unusual we really are!



Images credit: NASA / Kepler Dan Fabricky (L), of a selection of the known Kepler exoplanets; Rebecca G. Martin and Mario Livio (2015) ApJ 810, 105 (R), of 287 confirmed exoplanets relative to our eight solar system planets.

Observatories and Planetariums

Bruneau Dunes Observatory – Bruneau, ID

The observatory is now officially closed for the winter.

Herrett Telescope / Centennial Observatory
Herrett Center for Arts and Science
College of Southern Idaho
Twin Falls, Idaho, USA

CSI Centennial Observatory Twin Falls, ID

Event	Place	Date	Time	Admission
Telescope Tuesday	Centennial Observatory	Tuesday, Dec. 8th, 2015	6:00 to 9:00 PM	$1.50 or free with Faulkner Planetarium admission
Monthly Free Star Party	Centennial Observatory	Saturday, Dec 12th, 2015	6:00 PM to 12:00 AM	FREE
Telescope Tuesday	Centennial Observatory	Tuesday, Dec 22nd, 2015	6:00 to 9:00 PM	$1.50 or free with Faulkner Planetarium admission

Faulkner Planetarium Show Times (through Memorial Day)	
Tuesdays	7:00 PM
Fridays	7:00 PM 8:00 PM
Saturdays	1:30 PM 2:30 PM 3:30 PM 4:30 PM 7:00 PM 8:00 PM

Now Showing

Additional shows offered at certain times.

- Assistive listening devices available upon request.
- No food, drink, or late entry.
- Dark conditions and audio/visual effects may be too intense for children under four.

Supporters of Great Basin Observatory see light at end of the tunnel

Stars fill the sky above an ancient bristlecone pine tree in this undated photo taken at Great Basin National Park, which could be home to a new research telescope as early as next summer. Courtesy National Park Service.

By Henry Brean Las Vegas Review-Journal / reprinted with permission of the author. www.reviewjournal.com

The stars haven't aligned just yet for a planned observatory at Great Basin National Park, but its backers are within sight of their goal.

By year's end, members of the park's nonprofit foundation hope to have the $480,000 they need to build and open Great Basin Observatory in the mountains 300 miles northeast of Las Vegas.

If they succeed, the remote-controlled, 28-inch research telescope could be up and scanning some of the darkest, clearest skies in North America by as early as summer, foundation chairwoman Becky Mills said.

So far, the foundation and its partners have raised more than $385,000 in donations and pledges. That includes a single pledge from an anonymous donor who has agreed to match every dollar raised through the end of the year up to $125,000.

"We're not quite there, but we're close," said Mills, a former superintendent for the only national park located entirely in Nevada.

The actual construction shouldn't take long, she said. The prefab, modular building with its clam-shell roof could be installed in as a little as a month or two — once the snow melts in late spring.

Mills said she hopes to see the telescope on line in time for one of three key dates next year: the 100th anniversary of the National Park Service on Aug. 25, the annual Astronomy Festival at Great Basin National Park Sept. 29-Oct. 1, or the park's 30th anniversary Oct. 27.

The Park Service is providing land for the project near staff housing, about 7,000 feet above sea level, and has agreed to do all the environmental compliance planning and site preparation work. Park personnel will provide routine maintenance of the building and the surrounding property, Mills said.

To plan and operate the observatory, the foundation has partnered with the University of Nevada, Reno; Western Nevada College in Carson City; Concordia University in Irvine, Calif.; and Southern Utah University in Cedar City.

Longtime UNR physics and astrophysics professor David Bennum said there has been talk for years about building a telescope at Great Basin National Park, which he called "the best location left in the U.S." for stargazing.

"An instrument like this in a place like the park is going to be a dramatic opportunity for students," Bennum said. "This would give us a chance for real research in the area."

Eventually, the new scope could spur the development of a graduate program in astronomy and astrophysics at UNR. The university already has a "nice" 24-inch scope, Bennum said. "Unfortunately, it's in Reno."

Mills said the other universities involved are equally excited about the project, which will give students and research faculty the chance to make new discoveries or follow up on work being done at the largest and most overbooked observatories around the world.

The new telescope will also provide a tangible reason — beyond simple aesthetics — to fight light pollution and preserve the dark night sky at Great Basin, she said.

And astronomers won't have to travel to remote eastern Nevada and sit up all night in the cold to use the observatory. Mills said images captured by the telescope will be uploaded to the Internet for all to examine and appreciate.

Logo of the Great Basin Observatory via the National Park Service Public Domain

http://www.greatbasinobservatory.org/

About the Magic Valley Astronomical Society

Magic Valley Astronomical Society
P.O. Box 445
Kimberly, ID, USA 83341

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, $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.

Membership Benefits:
Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others please contact President Robert Mayer, 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 circa 1980.