



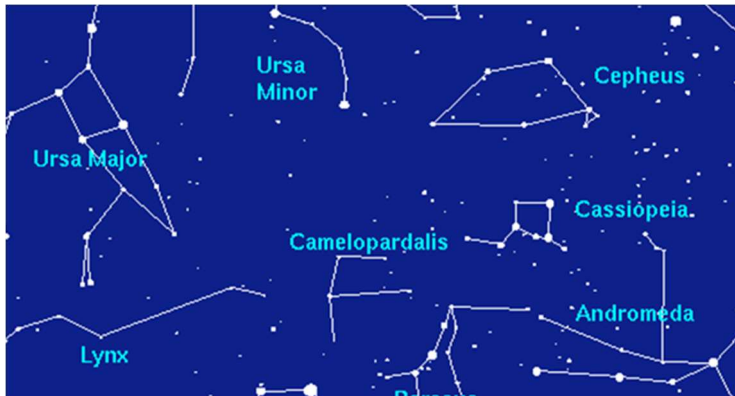
FEBRUARY 2023

NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

FEB 2023 PRESIDENT'S NOTE

I thought this year I would feature little known constellations in my president's notes. When listening to night sky tours I was fascinated by the shy (hard to see) constellation of Camelopardalis. Its fun name drew me to wanting to learn more.



Camelopardalis Constellation

The Camelopardalis constellation is part of the Ursa Major Family of 10 constellations which rotate around the north celestial pole throughout the year. Its name comes from the Latin derivation of the Greek word for "giraffe". The giraffe was called the "camel-leopard" because it had a long neck like a camel and a body with spots, like a leopard.

The Camelopardalis constellation was created by the Dutch astronomer Petrus Plancius and documented by the German astronomer Jakob Bartsch in 1624. Camelopardalis is the 18th largest constellation in the night sky, occupying an area of 757 square degrees. It belongs to the Ursa Major family of constellations, along with Boötes, Canes Venatici, Coma Berenices, Corona Borealis, Draco, Leo Minor, Lynx, Ursa Major, and Ursa Minor.

Camelopardalis has three stars with known planets and no Messier objects. The brightest star in the constellation is Beta Camelopardalis. The October Camelopardalids are the only meteor shower associated with the constellation.

The Giraffe constellation is pretty faint, with no stars brighter than fourth magnitude. The Greeks did not see any stars in

Camelopardalis and thought this region of the sky, as well as what is now the constellation Lynx, was empty. There are no myths associated with the constellation as it was only created in the 17th century. Camelopardalis contains two formally named stars: Mago and Tonatihu.

While the giraffe is not a reference to mythology, the constellation's name could be a reference to the book of Genesis in the Bible, but this remains doubtful. When Jacob Bartsch included Camelopardalis on his star map of 1624, he described the constellation as a camel on which Rebecca rode into Canaan, where she was to marry Isaac. Since Camelopardalis represents a giraffe and not a camel, this explanation does not seem likely.

Camelopardalis contains Kemble's Cascade, an asterism formed by a cascade of relatively faint stars, and several notable deep sky objects: the open cluster NGC 1502, the Oyster Nebula (NGC 1501), the spiral galaxy NGC 2403, and the dwarf irregular galaxy NGC 1569.

Kemble's Cascade is an asterism formed by more than 20 stars between magnitude 5 and 10 that form a straight line in the sky. The line stretches over a distance of five moon diameters and ends at an open star cluster, NGC 1502. It is a small cluster, containing about 45 stars. The asterism was named after Father Lucian J. Kemble, a Franciscan Friar who discovered it and wrote a letter to Walter Scott Houston (columnist for Sky and Telescope magazine) describing the sight as "a beautiful cascade of faint stars tumbling from the northwest down to the open cluster NGC 1502.

NGC 2403 is an intermediate spiral galaxy approximately 8 million light years distant. The galaxy was first discovered in the 18th century by the German-born British astronomer Frederick William Herschel. The northern spiral arm of NGC 2403 connects to NGC 2404, a nebulous region in an external galaxy, also located in the constellation Camelopardalis. NGC 2403 was the first galaxy discovered beyond our local group that contained known Cepheid variables. Two supernovae were also reported in the galaxy in the last century.

There are so many other things to discover in this delightful illusive constellation. I hope you will take the time to discover something new or to visit an old friend with fresh eyes.

Happy Viewing

SPEAKER BIO FOR FEBRUARY

Samuel (Sam) Myers is a Ph.D. student at the Lunar and Planetary Laboratory at the University of Arizona where he does research as an NSF Graduate Research Fellow.

His work is focused on observing and modeling Near-Earth Asteroids, with an eye towards understanding their physical



properties. He also has a strong interest in science policy and does work in this area to promote planetary defense and good governance practices. He will be speaking at our February 3rd HAC meeting on the science policies regarding planetary defense and good governance practices.

WELCOME OUR NEW MEMBERS

Petra Steinmetz of Naperville Illinois joined at the January Solar Saturday event. Petra and her husband Barry are frequent visitors to the area. Kevin O'Brien and Mary Coyle of Sierra Vista joined as a family in January. Welcome, we are glad you joined.

2023 DUES

If you have not paid your 2023 dues, there are several ways to do so:

1. You can pay your dues in person by cash or check made out to Huachuca Astronomy Club. See the treasurer, Ted Forte, at a meeting or event.
2. You can mail your dues check to the Huachuca Astronomy Club PO Box 922, Sierra Vista AZ 85636
3. You can pay online by visiting www.hacastronomy.org and pulling down the membership menu. You'll be directed to Pay Pal where you can use your Pay Pal account OR your credit card.
4. If you have a Pay Pal account, you can use PayPal Direct to send your payment to paypal@hacastronomy.org
5. If you have a Zelle account with your bank, you can make a dues payment by transferring funds to twforte@powerc.net

If you are uncertain of your dues status, please contact the treasurer (Ted Forte tedforte511@gmail.com)

HOW DO YOU SAY THAT?

Want to know how to pronounce Camelopardis? Just visit <https://www.astroleague.org/al/astnote/astnotes.html> and scroll down to D4 - Astronomical Pronunciation Guide – Constellations. There are also guides to pronounce star names, solar system objects and more.

KARTCHNER OBSERVATORY (NOW HAASP OBSERVATORY)

The effort to create an observatory at Kartchner Caverns State Park is ramping up. Park Ranger Ritch Rummeler is now actively looking for funding options and has permission to proceed from the park administration.

The working name for the observatory is now HAASP (Huachuca Astronomy Arizona State Parks Observatory).

There is now an action group on groupsio for those members wishing to work toward making the observatory a reality. Contact Ted Forte if you are interested in getting involved.

MARK YOUR CALENDARS

Our two regular events at the Patterson Observatory each month are "Public Night" which is held in the evening on the Thursday nearest first quarter moon beginning a half hour after sunset and "Solar Saturday" which is held from 9am to 11am on the second Saturday of the month. The February Public Night is Feb 23 starting at 7pm and Solar Saturday is Feb 11.

We will host a group from the local 4-H club at the Patterson Observatory on February 9, starting at 6:30 PM.

We get requests for outreach events frequently. Please watch the HacAstro group for new events. If you are not a member of that group, just send an email to: main+subscribe@HACastro.groups.io to join.

Outreach is both fun and important. If you've not participated yet, you are more than welcome to start. All you have to do is show up and bring your enthusiasm. We can always use more outreach stars. Try it, I bet you'll like it!

SPEAKER FOR KARTCHNER STAR PARTY

Pleased to announce that Kevin Hainline (Assistant Research Professor, Steward Observatory and member of the JWST/NIRCam Science team) will be our speaker at the Kartchner Star party on April 22, 2023. His talk will be on the latest results from the JADES GTO survey to explore galaxy evolution with JWST.

Some of you may remember Kevin as he was our speaker at the April 2018 meeting.

The talk will be at 5:30 pm in the Discovery Center theater.

The star party starts (officially) at 1 pm with solar viewing. There will be stargazing after dark weather permitting.

HAC members participating in the event are entitled to free entry to the park – just tell the gate attendant that you are an astronomer setting up for the star party.

This year's event coincides with the Park's Earth Day celebration.

THE BUCKET LIST -FEBRUARY 2023

BY VINCE SEMPRONIO

This column highlights interesting non-seasonal nighttime, and sometimes daytime sky events that the reader may not be aware of and may wish to observe. I'll cover one-off events that are special, rare, or uncommon.

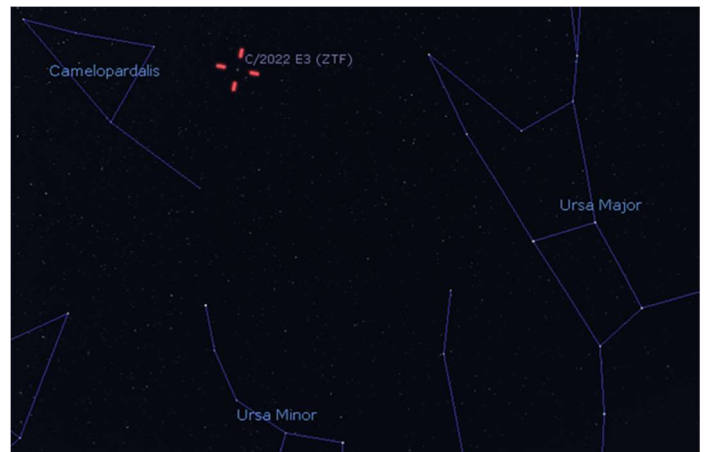
THE TERM OF THE MONTH. Now pay attention students to the astronomy term of the month. The word is conjunction. We colloquially use the term to refer when objects in the sky are close to each other, but that isn't very scientific, is it? Technically speaking, a conjunction occurs when two astronomical objects have either the same right ascension or the same ecliptic longitude. The latter means that they are located perpendicular to each other along the path the ecliptic. I don't know about you, but I never can see those invisible lines in the sky, so for the sake of argument, we'll use the colloquial definition.

THE STAR OF THE MONTH. During the winter season, Sirius once again makes an appearance. This year, its white dwarf secondary will be near maximum separation (11.3"). This is an extremely difficult double star to split mainly because of the large magnitude difference between the two (-1.46 and 8.7) and the close separation. Sirius also gets, at best, only about 41 degrees altitude at our latitude. On Valentine's Day, Sirius is on the meridian around 8:30pm.

THE COMET OF THE YEAR...SO FAR

Comet (C/2022 E3) ZTF is at it's best early this month when it is brightest and closest to Earth. But it is moving very fast, so don't procrastinate. Here is its location on the evening of February 1st around 9:30pm. For those with GOTO capabilities, it is located at RA: 6h 10m and DEC: 68d 45'.

While we can wish that we get to observe a naked eye comet sometime this year, until then, ZTF is the best we have. If you don't frequent the HAC user group, you are missing out on beautiful images of this comet taken by our members. It is free to use and is located online at <https://hacastro.groups.io/g/main>.



Forward a few days to February 5th, 8:30pm, Comet C/2022 E3 (ZTF) at magnitude +5.7 is ~1.5 degrees from the bright star Capella. Capella is a magnitude zero star, the third brightest in the northern sky. The full moon may interfere with observing the comet. The comet, then is 48 million miles from Earth while Capella is 43 light years away. The nearby (in the sky) star Almaaz is magnitude three but is over 2,000 light years away. It is slightly hotter than our Sun but is around 130 times larger.



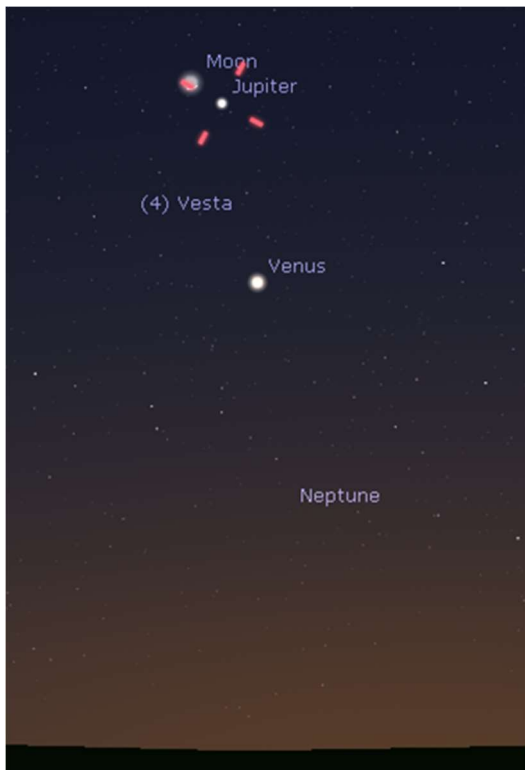
February 10th – 9:30pm – Mars meets a comet. Mars at magnitude zero is still a very bright object which must have caught the attention of comet C/2022 E3 (ZTF), as over the next 24 hours it makes a close pass to the planet. The comet is now at approximately magnitude +6.5. They are about a degree apart but pass closer together after they set. The comet is 1.2AU away from Earth while Mars is 1.6AU away. The comet is closer to Mars at 0.6AU.



At 5:00am on the morning on February 15th asteroid (1) Ceres is 6' away from the star 34 Virgo high in the SW sky. Ceres, at magnitude +7.5 is dimmer than the star which is magnitude +6.1. This is a good opportunity to observe how different an asteroid appears compared to a star. Both will appear as point sources (dots), but because Ceres has a very tiny surface area, it won't twinkle as will the star. This simulated view is through an 8" SCT with a 20mm 52-degree eyepiece.



February 22nd – Just after sunset, a close pairing of the Moon and Jupiter with Venus nearby. This type of events is not that rare, but they certainly are easy on the eye. At 6:30pm, 15 minutes after sunset, look for Venus and if you have a GOTO telescope, do a solar system alignment on Jupiter. The pair will be a little over a degree apart, so use a wide field eyepiece to attempt both together. Jupiter is occulted by the Moon this night in very southern South America.



And finally....

Each month I'll offer up a trivia question that may sometimes require some research. When the HAC Newsletter is published each month, I'll post a thread on the HAC user group with the monthly question and the first person to answer correctly gets bragging rights till next month.

February 2023 Trivia Question: Consider the planets in this order; Venus, Mars, Jupiter, Mercury, Saturn, Uranus, Neptune, Pluto. What does the order represent?

BOWLING FOR GALAXIES

BY TED FORTE

Consider. When we look up with our eyes alone, we see only the brightest objects. Apply binoculars and the view becomes cluttered with stars. Add a telescope and you'll be able to reach beyond the confines of our galaxy. Increase the size of your telescope and you can peer even deeper into the cosmos. The sky reveals itself in ever fainter, ever more distant layers. Images like the Hubble and JWST deep fields demonstrate that anywhere you look, the sky contains more galaxies than we can count. How mind blowing is that?

I recently came across my observing log for the night of May 22, 2009. I was attending the East Coast Star Party in Coinjock, North Carolina. It turned out to be a mostly cloudy night and we observers were reduced to chasing "sucker holes". One long-lasting clear spot developed just after midnight. It was centered on the bowl of the big dipper. I settled in to explore a galaxy cluster (Abell 1377) in the south east corner of the bowl with my 18-inch Dob. I was able to discern seven individual galaxies from a clump of mottled background (I like to call it "lumpy darkness") half the size of the moon.

A small group gathered around my scope and we decided to see how many NGC galaxies we could locate inside the boundaries of the bowl: the trapezoidal area bounded by Dubhe (Alpha Ursae Majoris), Merak (Beta Ursae Majoris), Phad (Gamma Ursae Majoris) and Megrez (Delta Ursae Majoris) which constitutes just over 44 square degrees of sky. (About .1% of the entire sky by the way).

That night we were racing the clouds; our window into clear sky was fleeting, and we had five observers to cycle through at each stop, yet we still managed to confirm 21 galaxies in a little over an hour, and that was just seeking NGC's and screening for the brightest of them. It made me curious to see just how many galaxies there are inside the bowl.

A data base search with Sky Tools 4 planetarium software reveals that in the area of sky defined by the bowl of the big dipper there are about 5,000 galaxies that can be reached by earth bound telescopes. They range in magnitude from about magnitude 11 to over magnitude 23 (15 million times fainter than we can see with our naked eyes). If we extend the search to all of Ursa Major the number approaches 33,000!

How many can we mortals see in the bowl? Well, there are about 60 galaxies brighter than 15th magnitude. A 17.5-inch scope in decent skies should be able to reel them in. S&T's Pocket Sky Atlas shows nine bright galaxies, all easily reached by an 8-inch telescope.

The NGC contains 45 galaxies within the boundaries of the bowl: 46 if you include MCG 09 -19-126 (Z 268-57, PGC 35811) which some references list as NGC 3737A. The Uranometria atlas shows about 80 individual galaxies and five galaxy clusters that could presumably be reached by large amateur telescopes.

The next time you look at the Big Dipper's bowl, try to contemplate the thousands of 'Island Universes' contained within that small patch of sky. I hope you'll never see the dipper's bowl the same again.



NASA NIGHT SKY NOTES FEBRUARY 2023

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

SPOT THE KING OF PLANETS: OBSERVE JUPITER

DAVID PROSPER

Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its awesome size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together they would still only be half as massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our

inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud tops with such violence that the fireballs and dark impact spots were not only seen by NASA's orbiting Galileo probe, but also observers back on Earth!

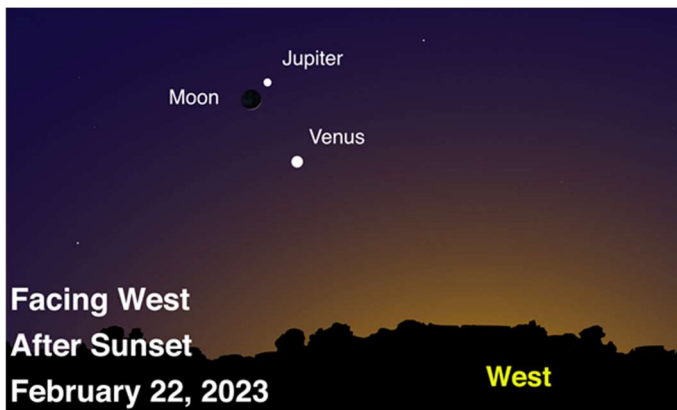
Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million km)! While the King of Planets has a coterie of around 75 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Calisto – can be easily observed by Earth-based observers with very modest equipment. These are called, appropriately enough, the Galilean moons. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but sometimes they can pass behind or in front of Jupiter, or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening - and night to night – can be a rewarding project! You can download an activity guide from the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

NASA's Juno mission currently orbits Jupiter, one of just nine spacecraft to have visited this awesome world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. In 2024 NASA will launch the Europa Clipper mission to study this world and its potential to host life inside its deep subsurface oceans in much more detail. Find the latest discoveries from Juno and NASA's missions at nasa.gov.



This stunning image of Jupiter's cloud tops was taken by NASA's Juno mission and processed by Kevin M. Gill. You too can create amazing images like this, all with publicly available data from Juno. Go to missionjuno.swri.edu/junocam to begin your image procession journey – and get creative!

Full Image Credit: NASA/JPL-Caltech/SwRI/MSSS; Processing: Kevin M. Gill, license: CC BY 2.0) <https://creativecommons.org/licenses/by/2.0/> Source: <https://apod.nasa.gov/apod/ap201123.html>



Look for Jupiter as it forms one of the points of a celestial triangle, along with Venus and a very thin crescent Moon, the evening of February 22, 2023. This trio consists of the brightest objects in the sky – until the Sun rises! Binoculars may help you spot Jupiter's moons as small bright star-like objects on either side of the planet. A small telescope will show them easily, along with Jupiter's famed cloud bands.

How many can you count? Keep watching Jupiter and Venus as the two planets will continue to get closer together each night until they form a close conjunction the night of March 1. Image created with assistance from Stellarium.

PICTURES FROM HAC ASTRO



Comet C/2022 E3 by Rik Hill



Comet C/2022 E3 by Jay LeBlanc



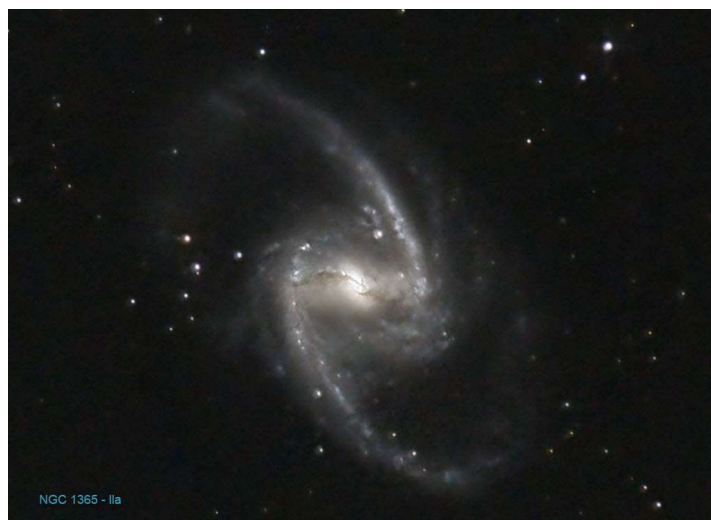
Comet C/2022 E3 by Mark Orvek



Comet C/2022 E3 by Glen Sanner



Comet C/2022 E3 by Len Amburgey



NGC 1365 by Len Amburgey



Various Nebulae by Len Amburgey



NGC 253 Sculptor Galaxy by Len Amburgey



NGC 1097 by Len Amburgey

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HAC Feb - Mar 2023 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
Jan 29	30 Mars occulted by the moon 9:44 PM	31	Feb 1	2	3 HAC Meeting Room A102 7PM	4
5  11:29 AM	6	7	8	9 4-H Club at Patterson 6:30PM	10	11 Solar Saturday 9-11AM Patterson
12	13  9:01 AM	14 	15 Venus and Neptune 0.01 degrees	16	17	18
19	20  12:06 AM 	21	22 Venus/Jupiter Moon Conjunction	23 Patterson Public Night 7:00 PM	24	25
26	27  1:06 AM Mars/Moon 1.1°	28	1 Mar	2 Venus/Jupiter 0.5°	3 HAC Meeting Room A102 7PM	4
5	6	7  5:40 AM	8	9	10	11 Solar Saturday 9-11AM Patterson
12 Daylight Savings Time Begins	13	14  7:08 PM	15	16	17 	18
19	20 Vernal Equinox 2:24 PM	21  10:23 AM Ceres opposition	22 Jupiter/Moon 0.5°	23 Patterson Public Night 7:30 PM	24 Venus/moon 0.1° Uranus/moon 1.5°	

All times local MST

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