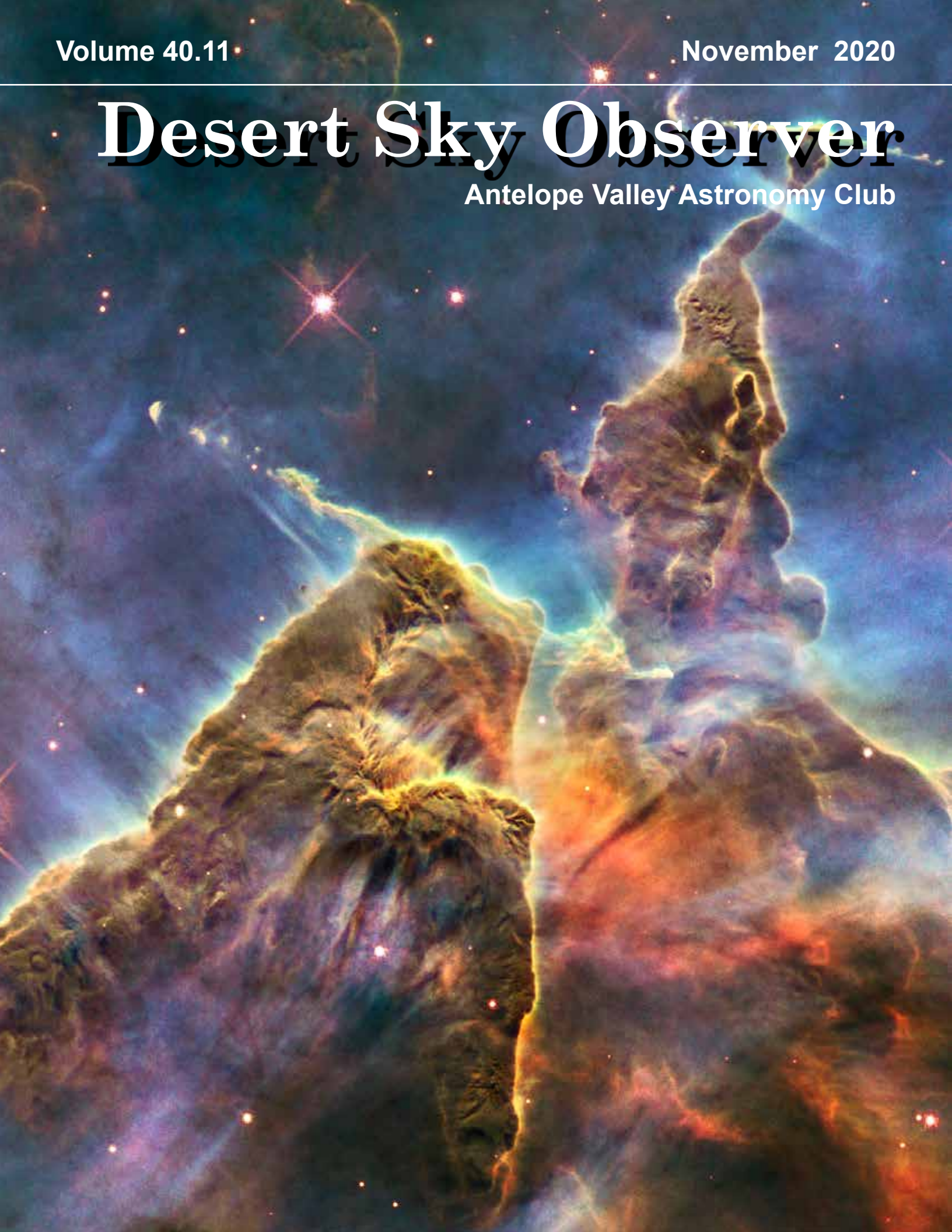


Volume 40.11

November 2020

Desert Sky Observer

Antelope Valley Astronomy Club



Desert Sky Observer

www.avastronomyclub.org November 2020

Upcoming Events

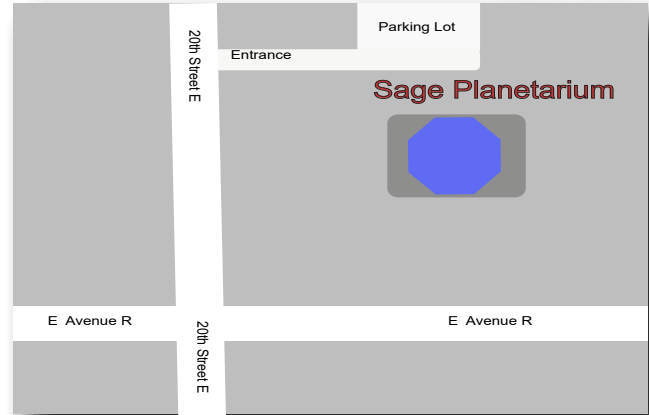
November 1: End of Daylight Saving Time
November 3: VOTE
November 13: Club Meeting - nope
November 14: DSSP TBA

December 11: Club Meeting Maybe
December 12: Xmas Party-- Canceled

Any clear night: Personal Star Party



AVAC Calendar



Board Members

President: Darrel Bennet (661) 220-0122
president@avastronomyclub.org

Vice-President: Matt Leone (661) 713-1894
vice-president@avastronomyclub.org

Secretary: Rose Moore (661) 972-1953
secretary@avastronomyclub.org

Treasurer: Rod Girard (661) 803-7838
treasurer@avastronomyclub.org

Appointed Positions

Newsletter Editor: Phil Wriedt (661) 917-4874
dso@avastronomyclub.org

Equipment & Library:
John Van Evera 661-754-1819
library@avastronomyclub.org

Club Historian: vacant
history@avastronomyclub.org

Webmaster: Steve Trotta (661) 269-5428
webmaster@avastronomyclub.org

Astronomical League Coordinator:
Frank Moore (661) 972-4775
al@avastronomyclub.org



Monthly Meetings

Monthly meetings are held at the **S.A.G.E. Planetarium** in Palmdale, the second Friday of each month except December. The meeting location is at the northeast corner of Avenue R and 20th Street East. Meetings start at 7 p.m. and are open to the public. *Please note that food and drink are not allowed in the planetarium.*

Membership

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

Membership entitles you to ...

- The Desert Sky Observer -- monthly newsletter
- The Reflector -- the publication of the Astronomical League.
- The AVAC Membership Manual.
- To borrow club equipment, books, videos, and other items.

AVAC

PO Box 8545

Lancaster, CA 93539-8545

Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/.



www.avastronomyclub.org

The Antelope Valley Astronomy Club, Inc. is a §503(c)(3) Non-Profit Corporation.

The AVAC is a Sustaining Member of The Astronomical League and the International Dark-Sky Association

President's Message

By Darrel Bennet

Our Club's President has apparently been left speechless by the events of the past month; even considering the expected event of November, the Dark Sky Star Party scheduled for November 14. Take note this will probably be the last event for the year.

Let's all hope that Darrel recovers from this malady soon.

editor

On The Cover

This craggy fantasy mountaintop enshrouded by wispy clouds looks like a bizarre landscape from Tolkien's *The Lord of the Rings*. The NASA/ESA Hubble Space Telescope image, which is even more dramatic than fiction, captures the chaotic activity atop a pillar of gas and dust, three light-years tall, which is being eaten away by the brilliant light from nearby bright stars. The pillar is also being assaulted from within, as infant stars buried inside it fire off jets of gas that can be seen streaming from towering peaks.

This turbulent cosmic pinnacle lies within a tempestuous stellar nursery called the Carina Nebula, located 7500 light-years away in the southern constellation of Carina. The image celebrates the 20th anniversary of Hubble's launch and deployment into an orbit around the Earth.

Scorching radiation and fast winds (streams of charged particles) from super-hot newborn stars in the nebula are shaping and compressing the pillar, causing new stars to form within it. Streamers of hot ionised gas can be seen flowing off the ridges of the structure, and wispy veils of gas and dust, illuminated by starlight, float around its towering peaks. The denser parts of the pillar are resisting being eroded by radiation.

Nestled inside this dense mountain are fledgling stars. Long streamers of gas can be seen shooting in opposite directions from the pedestal at the top of the image. Another pair of jets is visible at another peak near the centre of the image. These jets, (known as HH 901 and HH 902, respectively, are signposts for new star birth and are launched by swirling gas and dust discs around the young stars, which allow material to slowly accrete onto the stellar surfaces.

Hubble's Wide Field Camera 3 observed the pillar on 1-2 February 2010. The colours in this composite image correspond to the glow of oxygen (blue), hydrogen and nitrogen (green), and sulphur (red).

Credit: NASA, ESA, M. Livio and the Hubble 20th Anniversary Team (STScI)

From the Secretary

By Rose Moore

Many thanks to the members who turned out for the DSSP at Red Cliffs on Oct. 17th. We had a beautiful sky and Milky Way! There was a father and daughter who drove up from the Woodland Hills area, looking for a dark sky area. They had their own telescope, but came over to our area to talk to us, and look through our member's scopes.

Our meeting for November is canceled, of course. We will have a DSSP on Nov. 14th, and will announce a place and time as we get closer to the date.

For those of you who are unaware, we have also canceled the club Christmas Party for early December, due to the Covid restrictions.

If anyone has any observing stories to tell, please contact Phil by email, and submit it for the next DSO.

Venus is up bright and early in the morning, starting around 4:20am. Jupiter and Saturn are still both up in the evening, but are both down below the horizon by 10:50pm and 11:15pm, respectively. There are still a lot of dark sky objects to view with a telescope when the Moon is not up, so go out and take a look! The Leonid Meteor showers are this month, and will peak on the night of Nov. 16th to the early morning of Nov. 17th. They will not be particularly dense this year, but may be worth going out to view.

Stay safe, clear skies!

Rose

Club's Trailer For Sale

The Executive Board has decided that the Club's trailer is no longer needed. The last active use for the trailer was to store members scopes overnight at the Poppy Festival, and lately has been storing a few boxes of club records. It's believed to be a 6x10 single axle cargo van. Contact Darrel for more info...

Member Scope For Sale

Member Duane Lewis is selling his 9.25 inch Celestron CGEM OTA with the tripod, CGE mount, counterweights, one 1.25" 20mm Plossl eyepiece, a 1.25" diagonal and a 2" diagonal, telrad mount, and a Denkmeir (unknown model) binocular viewer. The OTA was tuned up by member Don Bryden before he moved. It has not been used since. Price is \$1200. Duane is unable to have this set up for viewing because of lack of space. So arrangements will have to be made for viewing the scope and accessories. For more info please contact Duane by email only: gurba1826@gmail.com -- or contact Rose by email: rmorion@bak.rr.com

The International Space Station: 20 Continuously Crewed Years of Operation

by David Prosper

Did you know that humans have been living in the International Space Station, uninterrupted, for twenty years? Ever since the first crew members docked with the International Space Station (ISS) in November 2000, more than 240 people have visited this outpost, representing 19 countries working together. They have been busy building, upgrading, and maintaining the space station - while simultaneously engaging in cutting-edge scientific research.

The first modules that would later make up the ISS were launched into orbit in 1998: the Russian Zarya launched via a Proton-K rocket, and the US-built Unity module launched about a week and a half later by the Space Shuttle Endeavour. Subsequent missions added vital elements and modules to the Space Station before it was ready to be inhabited. And at last, on November 2, 2000, Expedition-1 brought the first three permanent crew members to the station in a Russian Soyuz capsule: NASA astronaut William M. Shepherd and Russian cosmonauts Sergei Krikalev and Yuri Gidzenk. Since then, an entire generation has been born into a world where humans continually live and work in space! The pressurized space inside this modern engineering marvel is roughly equal to the volume of a Boeing 747, and is sometimes briefly shared by up to 13 individuals, though the average number of crew members is 6. The unique microgravity environment of the ISS means that long-term studies can be performed on the space station that can't be performed anywhere on Earth in many fields including space medicine, fluid dynamics, biology, meteorology and environmental monitoring, particle physics, and astrophysics. Of course, one of the biggest and longest experiments on board is research into the effects of microgravity on the human body itself, absolutely vital knowledge for future crewed exploration into deep space.

Stargazers have also enjoyed the presence of the ISS as it graces our skies with bright passes overhead. This space station is the largest object humans have yet put into orbit at 357 feet long, almost the length of an American football field (if end zones are included). The large solar arrays – 240 feet wide - reflect quite a bit of sunlight, at times making the ISS brighter than Venus to observers on the ground! Its morning and evening passes can be a treat for stargazers and can even be observed from brightly-lit cities. People all over the world can spot the ISS, and with an orbit only 90 minutes long, sometimes you can spot the station multiple times a night. You can find the next ISS pass near you and receive alerts at sites like NASA's Spot the Station website (spotthestation.nasa.gov) and stargazing and satellite tracking apps.

Hundreds of astronauts from all over the world have crewed the International Space Station over the last two decades, and their work has inspired countless people to look up and ponder humanity's presence and future in space. You can find out more about the International Space Station and how living and working on board this amazing outpost has helped prepare us to return to the Moon - and beyond! - at nasa.gov.

Desert Sky Observer

www.avastronomyclub.org

November 2020



The ISS photobombs the Sun in this amazing image taken during the eclipse of August 21, 2017 from Banner, Wyoming.

Photo credit: NASA/Joel Kowsky

More info: bit.ly/eclipseiss

A complete view of the ISS as of October 4, 2018, taken from the Soyuz capsule of the departing crew of Expedition 56 from their Soyuz capsule. This structure was built by materials launched into orbit by 37 United States Space Shuttle missions and 5 Russian Proton and Soyuz rockets, and assembled and maintained by 230 spacewalks, with more to come!

Credit: NASA/Roscosmos

More info: bit.ly/issbasics



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.gov to find local clubs, events, and more!

Hubble Captures Supernova in NGC 2525



Pictured here is part of the captivating galaxy NGC 2525. Located nearly 70 million light-years from Earth, this galaxy is part of the constellation of Puppis in the southern hemisphere. Together with the Carina and the Vela constellations, it makes up an image of the Argo from ancient greek mythology.

On the left, a brilliant supernova is clearly visible in the image. The supernova is formally known as SN2018gv and was first spotted in mid-January 2018. The NASA/ESA Hubble Space Telescope captured the supernova in NGC 2525 as part of one of its major investigations; measuring the expansion rate of the Universe, which can help answer fundamental questions about our Universe's very nature. Supernovae like this one can be used as cosmic tape measures, allowing astronomers to calculate the distance to their galaxies.

ESA/Hubble has now published a unique time-lapse of this galaxy and it's fading supernova.

Credit:

ESA/Hubble & NASA, A. Riess and the SH0ES team

Acknowledgment: Mahdi Zamani

Space News

News from around the Net

Distant Space Debris A Threat To Satellites

New observations show we're not tracking a majority of debris in higher orbits. The problem of space debris is complex and sobering. Since the launch of Sputnik 1 in early October 1957, the population of objects actively tracked and cataloged in Earth orbit has increased to more than 20,700 satellites and fragments, from debris in low-Earth orbit (LEO) to satellites in geosynchronous and geostationary (GEO) orbits 22,236 miles (35,786 kilometers) from the Earth. (continued at <https://skyandtelescope.org/astronomy-news/distant-space-debris-threat-satellite/>)



Water on the moon is more common than we thought, studies reveal

Lunar "cold traps" bode well for future Artemis astronauts, NASA says. For the first time ever, scientists have identified water on the moon's sunlit surface. They also found that water is more common on the moon than previously thought, with pockets of ice hiding in shadowy regions of "eternal darkness," some as small as a penny, new studies reveal. . . (continued at <https://www.space.com/water-on-moon-shadow-cold-traps-discovery>)



Pandemic Inspires Surge In Telescope Sales

A funny thing is happening during this long pandemic of COVID-19. People have been stuck at home and having to entertain themselves in seclusion, all of which seems to have inspired a newfound interest in the night sky. With that new interest comes equipment needs: Telescope vendors and manufacturers are reporting a surge in sales unlike any other experienced in the past — telescopes are flying off the shelves.. . . (continued at <https://skyandtelescope.org/astronomy-news/pandemic-inspires-surge-in-telescope-sales/>)



Calling On Amateur Astronomers: Observe Venus!

The Mercury-bound BepiColombo spacecraft will fly by Venus on October 15th, and the mission is asking amateurs for their help. BepiColombo, a joint mission of the European and Japanese space agencies, is headed for Mercury, due to arrive at the baked planet in late 2025. But Mercury isn't the only planet it will observe. . . . (continued at <https://skyandtelescope.org/astronomy-news/calling-on-amateur-astronomers-observe-venus/>)



How Planetary Nebulae Get Their Shapes

New research shows why planetary nebulae range in shape from spirals to butterflies. The wide variety of shapes and colors these celestial gems display has fascinated observers and theorists alike. These fantastic gas-and-dust eruptions from low-mass stars form shapes such as spirals, roses, butterflies, and even cosmic eyes. Now, a team of observers has looked one step earlier in stellar evolution to explain how these shapes come to be. . . (continued at <https://skyandtelescope.org/astronomy-news/how-planetary-nebulae-get-their-shapes/>)



Space News

News from around the Net. . .continued

Solved: the mystery of how dark matter in galaxies is distributed

The gravitational force in the Universe under which it has evolved from a state almost uniform at the Big Bang until now, when matter is concentrated in galaxies, stars and planets, is provided by what is termed ‘dark matter.’ But in spite of the essential role that this extra material plays, we know almost nothing about its nature, behavior and composition, which is one of the basic problems of modern physics. . . (continued at <https://phys.org/news/2020-10-mystery-dark-galaxies.html>)



New survey finds that single burst of star formation created Milky Way’s central bulge

Like most spiral galaxies, the Milky Way has a roughly spherical collection of stars at its center called the bulge. How the bulge formed has been a long-standing mystery, with many studies suggesting that it built up over time through multiple bursts of star formation. New research finds that the majority of stars in our galaxy’s central bulge formed in a single burst of star formation more than 10 billion years ago. . . (continued at <https://phys.org/news/2020-10-survey-star-formation-milky-central.html>)



The Horsehead Nebula in Orion: An unbridled look

On the night of July 27, 1913, astronomer E. E. Barnard noticed that the skies above Yerkes Observatory in southern Wisconsin were nearly perfect. The heavens were crystal clear and the Midwest air was surprisingly steady. He guided the gaze of the world’s largest refracting telescope in the direction of Orion, targeting a mysterious object he’d tried to glimpse many times since his comet-hunting days decades earlier... . (continued at <https://astronomy.com/news/2020/10/the-horsehead-nebula-in-orion-an-unbridled-look>)



Earth’s biggest telescopes reopen after months of COVID closures

After more than six months of COVID-related closures, observational astronomy is largely getting back to work. Many of the world’s biggest telescopes have reopened their domes in recent weeks, returning their gazes to the heavens for the first time since the pandemic forced a global shutdown of observational astronomy in March. Other major telescopes expect to reopen soon. (continued at <https://astronomy.com/news/2020/10/earths-biggest-telescopes-reopen-after-months-of-covid-closures>)



Astronomers discover activity on distant planetary object

Centaurs are minor planets believed to have originated in the Kuiper Belt in the outer solar system. They sometimes have comet-like features such as tails and comae -- clouds of dust particles and gas -- even though they orbit in a region between Jupiter and Neptune where it is too cold for water to readily sublimate, or transition, directly from a solid to a gas. . . (continued at <https://www.sciencedaily.com/releases/2020/10/201028124544.htm>)



Dark Sky Observing Sites

The Chuchupate parking lot is a half a mile beyond the Mt Pinos ranger station (on some maps The Chuchupate Ranger Sta., the parking lot is also called Frazier Mountain trailhead).

To get there, take the Frazier Mountain Park RD east about 7 miles from I-5, to Lake Of The Woods, Turn left on Lockwood Valley Rd. (If you see Mike’s Pizza on your left you missed the turn) In less than a mile there is a road to the left, go past the ranger station, the parking lot is on the right. The Club gathers in the upper end of the lot. The Elevation is 5430 feet. There is a vault toilet.



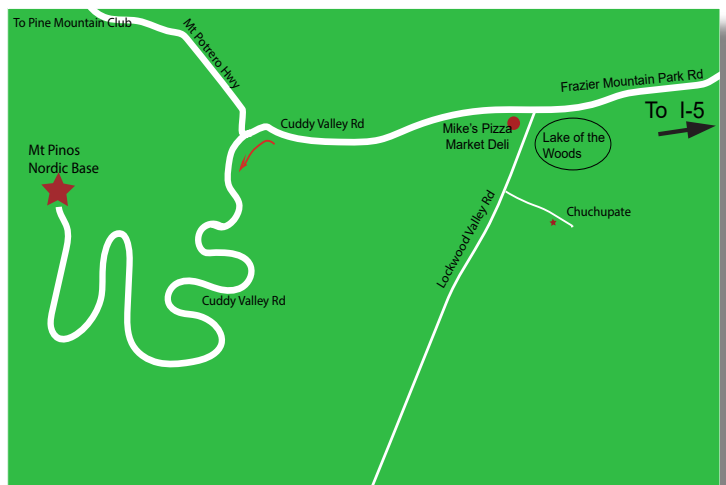
The Red Cliffs Natural Area is part of **Red Rock Canyon State Park** is a day use area and is not for use by the public after dark. The Club gets a special permit for a star party and pays a fee.

To get there: Take the CA-14 north 25 miles past Mojave. You will see giant red cliffs on the right side and a small sign that says “Red Cliffs Natural Area” and a dirt road. (If you see the large sign for the Ricardo campground, you drove a mile too far). Follow the road to the large parking lot (that hasn’t been graded in a long time). Elevation is 2410 feet. There is a vault toilet.

Mt Pinos is a parking lot at 8350 feet for the “Mt Pinos Nordic Base.” There is a vault toilet 300 yds to the east in the Chula Vista campground.

To get there: From I-5, get off at Frazier Mountain Park Rd and drive west about 7 miles to Mike’s Pizza/Market Deli at Lockwood Valley Rd. Keep on the main roadway (don’t turn left to go to Chuchupate). Continue past Mike’s Pizza on Cuddy Valley Rd (the road’s new name) about 5 miles. Continue straight (do not turn right on to Mil Potrero Hwy) for another 8 1/2 miles to the parking area.

Note: The entire drive is uphill



Planet Summary

The **Sun** starts October in Libra and crosses into Ophiuchus at the end of the month.

Mercury begins the month in the morning twilight achieving its Greatest Elongation West on the 10th at 19° and -0.6 mag. Mercury continues to brighten in the following days but loses altitude against the horizon as well as separation from the Sun.

Venus continues among the stars of Virgo, passing 4° N of Spica on the 15th. The waning Crescent Moon passes 3° N on the 12-13th. By mid-month Venus will recede to -3.9, half of brightness of May.

Mars is visible in the East as darkness falls, and rides high into the sky for most of the night. It achieves its second stationary point on the 15th, 13° to the west of its first stopping point and 67 days later. As it recedes from Earth Mars fades by a full magnitude in November from -2.1 to -1.1 by the 30th.

Jupiter is low in the southwest in the early evening. The gap between Saturn and Jupiter closes from 5° on the 1st to just over 2° at month end. The waxing crescent Moon slips by on the 18-19th.

Saturn like Jupiter is in the southwest evening sky. Saturn is 5° east of Jupiter on the 1st and 2.25° E at the months end.

Uranus will spend 2020 in southern Aries at magnitude 5.7.

Neptune will spend the month stationary in northeast Aquarius at mag 7.8. The Moon will pass 4° south on the 23th.

Pluto spends the month in Sagittarius at mag 14 and on the 13th will be conjunction with Jupiter at some 42'

The Moon slides past in the early morning of the 19th.

Sun and Moon Rise and Set



First Qtr Nov 21 Full Oct 31 & Nov 30 Third Qtr Nov 8 New Nov 14

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
11/1/2020	18:22	07:10	07:13	17:59
11/5/2020	20:46	10:52	06:18	16:55
11/10/2020	00:58	14:24	06:22	16:51
11/15/2020	06:56	17:29	06:27	16:47
11/20/2020	12:00	22:22	06:32	16:45
11/25/2020	14:32	02:13	06:37	16:43
11/30/2020	17:01	06:55	06:41	16:42

Planet Data*

Nov 1

	Rise	Transit	Set	Mag	Phase%
Mercury	06:16	11:51	17:27	1.39	15.44
Venus	04:27	10:30	16:31	-4.01	81.49
Mars	16:57	23:12	05:31	-2.13	98.12
Jupiter	12:44	17:41	22:38	-2.21	99.14
Saturn	13:03	18:03	23:03	0.59	99.77

Nov 15

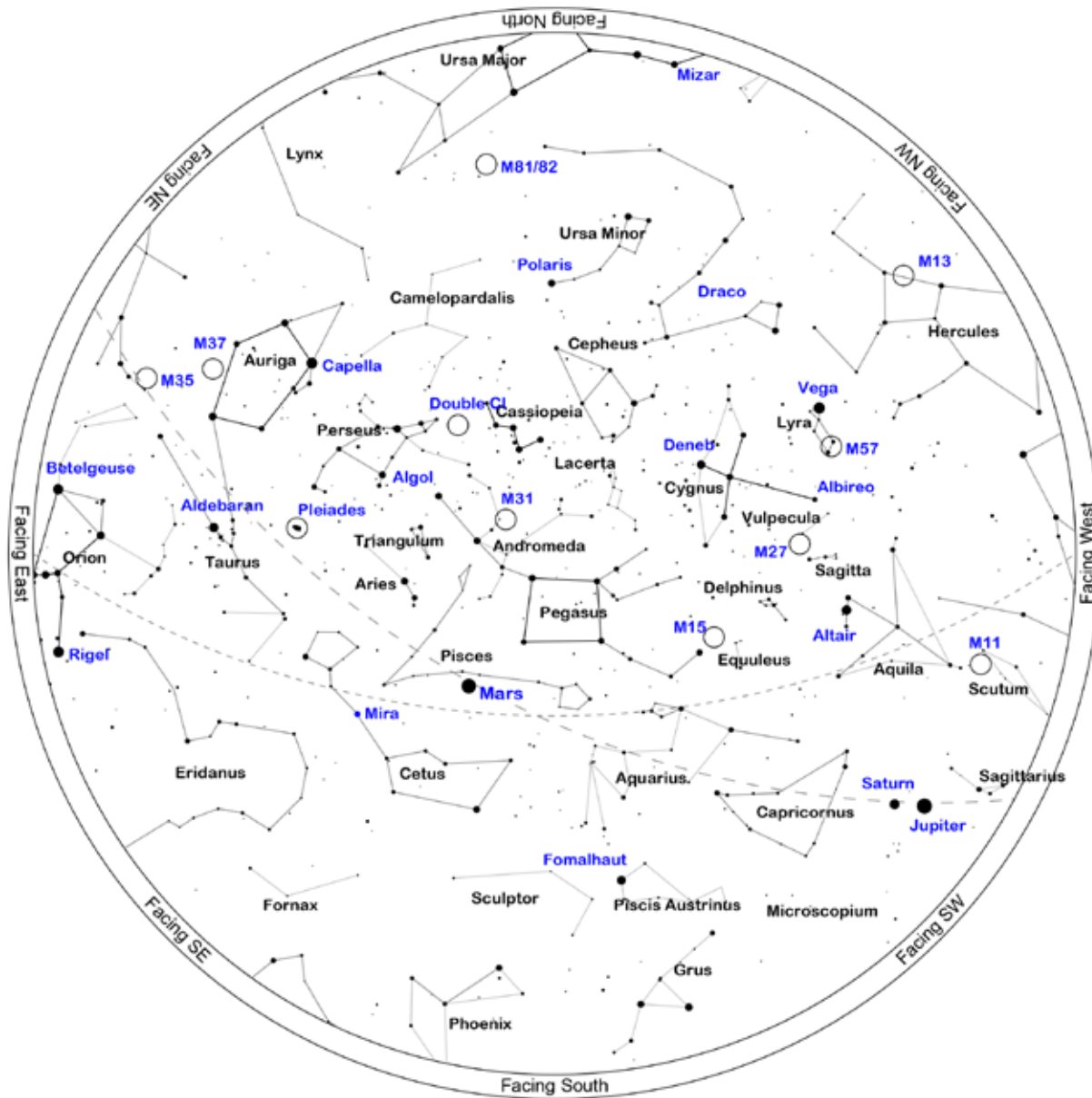
	Rise	Transit	Set	Mag	Phase%
Mercury	04:57	10:29	15:59	-0.69	74.01
Venus	03:56	09:39	15:21	-3.99	85.14
Mars	14:51	21:07	03:27	-1.66	95.33
Jupiter	10:54	15:51	20:49	-2.14	99.30
Saturn	11:07	16:08	21:08	0.62	99.80

Nov 30

	Rise	Transit	Set	Mag	Phase%
Mercury	05:49	10:57	16:05	-0.75	95.12
Venus	04:26	09:58	15:15	-3.95	88.53
Mars	13:53	20:14	02:37	-1.16	99.50
Jupiter	10:05	15:04	20:03	-2.07	99.49
Saturn	10:13	15:14	20:15	0.64	99.86

*Sun, Moon and Planetary date based on Quartz Hill, CA

Sky Chart



Location: Palmdale, CA 93551

Latitude: 34° 36' N, longitude: 118° 11' W

Time: 2020 November 14, 20:00 (UTC -08:00)

Powered by: Heavens-Above.com

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Deep Sky Star Party or the Saturday nearest the New Moon, in this case October 17, 2020. The list is sorted by the transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M23	Open	Sgr	17h 57m 04s	-18° 59.1'	6.0	09:08	14:16	19:24
NGC6543	P Neb	Dra	17h 58m 36s	+66° 38.0'	8.1	Circum	14:17	Circum
NGC6496	Globular	Sco	17h 59m 04s	-44° 16.0'	9.2	11:02	14:18	17:33
Barnard291	DkNeb	Sgr	17h 59m 43s	-33° 53.0'		10:05	14:18	18:31
Barnard292	DkNeb	Sgr	18h 00m 34s	-33° 20.0'		10:04	14:19	18:35
Barnard293	DkNeb	Sgr	18h 01m 12s	-35° 20.0'		10:13	14:20	18:26
M20	Open+D Neb	Sgr	18h 02m 42s	-22° 58.2'	5.0	09:26	14:21	19:16
M8	Open+D Neb	Sgr	18h 03m 41s	-24° 22.7'	5.0	09:32	14:22	19:12
Barnard295	DkNeb	Sgr	18h 04m 05s	-31° 09.0'		09:58	14:23	18:47
M21	Open	Sgr	18h 04m 13s	-22° 29.3'	7.0	09:26	14:23	19:19
NGC6530	Open	Sgr	18h 04m 31s	-24° 21.5'	4.6	09:33	14:23	19:13
NGC6528	Globular	Sgr	18h 04m 50s	-30° 03.3'	9.5	09:54	14:23	18:53
IC4684	Neb	Sgr	18h 09m 08s	-23° 26.1'		09:34	14:28	19:21
IC4685	Neb	Sgr	18h 09m 18s	-23° 59.2'		09:36	14:28	19:19
Barnard303	DkNeb	Sgr	18h 09m 28s	-23° 59.0'		09:37	14:28	19:20
IC1274	Neb	Sgr	18h 09m 51s	-23° 38.8'		09:36	14:28	19:21
IC1275	Neb	Sgr	18h 10m 07s	-23° 45.7'		09:36	14:29	19:21
NGC6572	P Neb	Oph	18h 12m 06s	+06° 51.2'	9.0	08:09	14:31	20:53
NGC6567	P Neb	Sgr	18h 13m 45s	-19° 04.5'	12.0	09:25	14:32	19:40
IC4701	Neb	Sgr	18h 16m 36s	-16° 38.0'		09:20	14:35	19:51
Barnard93	DkNeb	Sgr	18h 16m 53s	-18° 03.0'		09:25	14:36	19:46
IC1284	Neb	Sgr	18h 17m 39s	-19° 40.3'		09:30	14:36	19:42
M24	Open	Sgr	18h 18m 26s	-18° 24.3'	4.5	09:27	14:37	19:47
M16	Open+D Neb	Ser	18h 18m 48s	-13° 48.3'	6.5	09:14	14:37	20:01
Barnard308	DkNeb	Sgr	18h 19m 08s	-22° 14.0'		09:40	14:38	19:35
M18	Open	Sgr	18h 19m 58s	-17° 06.1'	8.0	09:25	14:39	19:52
M17	Open+D Neb	Sgr	18h 20m 47s	-16° 10.3'	7.0	09:23	14:39	19:56
HR6923	Mult	Dra	18h 23m 54s	+58° 48.0'	5.0	Circum	14:43	Circum
M28	Globular	Sgr	18h 24m 33s	-24° 52.1'	8.5	09:55	14:43	19:32
Barnard95	DkNeb	Sct	18h 25m 35s	-11° 44.0'		09:14	14:44	20:14
Barnard97	DkNeb	Sct	18h 29m 05s	-09° 55.0'		09:13	14:48	20:23
Abell44	P Neb	Sgr	18h 30m 11s	-16° 45.4'	12.6	09:34	14:49	20:04
NGC6637	Globular	Sgr	18h 31m 23s	-32° 20.8'	7.7	10:30	14:50	19:10
IC1287	Neb	Sct	18h 31m 26s	-10° 47.7'		09:18	14:50	20:23
M25	Open	Sgr	18h 31m 42s	-19° 07.0'	6.5	09:43	14:50	19:58
IC4725	Open	Sgr	18h 31m 48s	-19° 06.7'	4.6	09:43	14:50	19:58

Desert Sky Observer

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November 2020

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6642	Globular	Sgr	18h 31m 54s	-23° 28.5'	8.8	09:57	14:51	19:44
NGC6644	P Neb	Sgr	18h 32m 35s	-25° 07.7'	12.0	10:04	14:51	19:39
NGC6647	Open	Sgr	18h 32m 49s	-17° 13.6'	8.0	09:38	14:51	20:05
IC4732	P Neb	Sgr	18h 33m 55s	-22° 38.6'	13.0	09:56	14:53	19:49
NGC6656	Globular	Sgr	18h 36m 24s	-23° 54.2'	5.1	10:03	14:55	19:47
IC4756	Open	Ser	18h 38m 54s	+05° 27.0'	5.0	08:40	14:58	21:15
NGC6681	Globular	Sgr	18h 43m 12s	-32° 17.4'	8.1	10:42	15:02	19:22
NGC6694	Open	Sct	18h 45m 18s	-09° 23.0'	8.0	09:27	15:04	20:41
IC4776	P Neb	Sgr	18h 45m 51s	-33° 20.5'	12.0	10:49	15:04	19:20
Barnard318	DkNeb	Sct	18h 49m 42s	-06° 23.0'		09:23	15:08	20:53
M11	Open	Sct	18h 51m 05s	-06° 16.1'	7.0	09:24	15:10	20:55
M57	P Neb	Lyr	18h 53m 35s	+33° 01.7'	9.5	07:22	15:12	23:03
Barnard117	DkNeb	Sct	18h 53m 43s	-07° 24.0'		09:30	15:12	20:55
NGC6715	Globular	Sgr	18h 55m 03s	-30° 28.7'	7.7	10:46	15:14	19:41
NGC6717	Globular	Sgr	18h 55m 06s	-22° 42.0'	9.2	10:18	15:14	20:10
Barnard122	DkNeb	Sct	18h 56m 48s	-04° 45.0'		09:26	15:15	21:05
Barnard123	DkNeb	Sct	18h 57m 39s	-04° 43.0'		09:27	15:16	21:06
NGC6723	Globular	Sgr	18h 59m 33s	-36° 37.9'	7.3	11:18	15:18	19:18
Barnard128	DkNeb	Aql	19h 01m 40s	-04° 34.0'		09:30	15:20	21:10
NGC6729	BrNeb	CrA	19h 01m 54s	-36° 57.0'		11:22	15:21	19:19
Barnard326	DkNeb	Aql	19h 03m 00s	-00° 23.0'		09:20	15:22	21:23
NGC6749	Globular	Aql	19h 05m 15s	+01° 54.0'	11.1	09:16	15:24	21:32
Barnard329	DkNeb	Aql	19h 06m 59s	+03° 11.0'		09:14	15:26	21:37
NGC6760	Globular	Aql	19h 11m 12s	+01° 01.8'	9.1	09:24	15:30	21:35
Abell56	P Neb	Aql	19h 13m 07s	+02° 52.8'	12.4	09:21	15:32	21:42
NGC6772	P Neb	Aql	19h 14m 36s	-02° 42.4'	14.0	09:38	15:33	21:29
Barnard138	DkNeb	Aql	19h 16m 00s	+00° 13.0'		09:31	15:35	21:38
M56	Globular	Lyr	19h 16m 36s	+30° 11.0'	9.5	07:57	15:35	23:14
NGC6778	P Neb	Aql	19h 18m 25s	-01° 35.7'	13.0	09:39	15:37	21:35
Abell61	P Neb	Cyg	19h 19m 10s	+46° 14.5'	13.0	06:27	15:38	00:48
Barnard140	DkNeb	Aql	19h 19m 49s	+05° 13.0'		09:21	15:38	21:56
NGC6790	P Neb	Aql	19h 22m 57s	+01° 30.8'	10.0	09:35	15:42	21:49
NGC6803	P Neb	Aql	19h 31m 16s	+10° 03.3'	11.0	09:19	15:50	22:21
NGC6804	P Neb	Aql	19h 31m 35s	+09° 13.5'	12.0	09:22	15:50	22:19
Abell62	P Neb	Aql	19h 33m 18s	+10° 37.0'	13.0	09:19	15:52	22:25
NGC6807	P Neb	Aql	19h 34m 34s	+05° 41.0'	14.0	09:35	15:53	22:12
M55	Globular	Sgr	19h 40m 00s	-30° 57.7'	7.0	11:33	15:59	20:24
NGC6813	Neb	Vul	19h 40m 22s	+27° 18.5'		08:32	15:59	23:26
NGC6820	Neb	Vul	19h 42m 28s	+23° 05.2'		08:49	16:01	23:13
Barnard338	DkNeb	Aql	19h 43m 02s	+07° 27.0'		09:38	16:02	22:25
NGC6818	P Neb	Sgr	19h 43m 58s	-14° 09.1'	10.0	10:40	16:03	21:25

Desert Sky Observer

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November 2020

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC6826	P Neb	Cyg	19h 44m 48s	+50° 31.0'	8.8	06:07	16:03	02:00
Abell65	P Neb	Sgr	19h 46m 34s	-23° 08.2'	13.1	11:11	16:05	21:00
NGC6838	Globular	Sge	19h 53m 46s	+18° 46.6'	8.3	09:15	16:12	23:10
NGC6842	P Neb	Vul	19h 55m 02s	+29° 17.3'	14.0	08:39	16:14	23:48
HR7619	Mult	Cyg	19h 55m 38s	+52° 26.3'	4.9	05:47	16:14	02:41
Abell66	P Neb	Sgr	19h 57m 32s	-21° 36.6'	14.1	11:17	16:16	21:16
Barnard144	DkNeb	Cyg	19h 58m 00s	+35° 20.0'		08:15	16:17	00:18
NGC6853	P Neb	Vul	19h 59m 36s	+22° 43.2'	8.1	09:08	16:18	23:29
NGC6857	Neb	Cyg	20h 02m 48s	+33° 31.4'	11.4	08:29	16:21	00:14
IC4954	Neb	Vul	20h 04m 45s	+29° 15.1'		08:49	16:23	23:58
M75	Globular	Sgr	20h 06m 05s	-21° 55.3'	9.5	11:26	16:25	21:23
Barnard342	DkNeb	Cyg	20h 09m 30s	+41° 12.0'		07:55	16:28	01:02
NGC6885	Open	Vul	20h 12m 00s	+26° 29.0'	5.9	09:07	16:31	23:54
NGC6891	P Neb	Del	20h 15m 09s	+12° 42.2'	12.0	09:55	16:34	23:13
NGC6894	P Neb	Cyg	20h 16m 24s	+30° 33.9'	14.0	08:55	16:35	00:15
IC4997	P Neb	Sge	20h 20m 09s	+16° 43.9'	12.0	09:48	16:39	23:30
Barnard345	DkNeb	Cyg	20h 21m 00s	+46° 33.0'		07:26	16:40	01:53
NGC6913	Open	Cyg	20h 23m 57s	+38° 30.5'	6.6	08:25	16:43	01:00
Abell70	P Neb	Aql	20h 31m 33s	-07° 05.3'	14.3	11:07	16:50	22:33
Barnard348	DkNeb	Cyg	20h 34m 00s	+42° 05.0'		08:13	16:53	01:32
NGC6940	Open	Vul	20h 34m 26s	+28° 17.0'	6.3	09:22	16:53	00:24
NGC6960	Neb	Cyg	20h 45m 58s	+30° 35.6'		09:25	17:05	00:45
IC5068	Neb	Cyg	20h 50m 29s	+42° 28.6'		08:27	17:09	01:51
NGC6979	Neb	Cyg	20h 51m 00s	+32° 09.0'	11.0	09:23	17:10	00:56
IC5070	Neb	Cyg	20h 51m 00s	+44° 24.1'		08:14	17:10	02:05
NGC6981	Globular	Aqr	20h 53m 28s	-12° 32.2'	9.4	11:45	17:12	22:40
IC5076	Neb	Cyg	20h 55m 33s	+47° 23.7'		07:53	17:14	02:35
IC1340	Neb	Cyg	20h 56m 08s	+31° 02.8'		09:33	17:15	00:57
NGC6992	Neb	Cyg	20h 56m 19s	+31° 44.6'		09:30	17:15	01:00
NGC6996	Open	Cyg	20h 56m 30s	+44° 38.0'	10.0	08:18	17:15	02:13
NGC6997	Open	Cyg	20h 56m 39s	+44° 37.9'	10.0	08:18	17:15	02:13
Barnard352	DkNeb	Cyg	20h 57m 10s	+45° 53.0'		08:08	17:16	02:23
Barnard354	DkNeb	Cep	20h 58m 00s	+58° 09.0'		Circum	17:17	Circum
NGC7000	BrNeb	Cyg	20h 58m 48s	+44° 20.0'		08:22	17:17	02:13
M73	Open+Asterism	Aqr	20h 58m 56s	-12° 38.1'	9.0	11:50	17:18	22:45
NGC7006	Globular	Del	21h 01m 30s	+16° 11.0'	10.6	10:31	17:20	00:09
NGC7009	P Neb	Aqr	21h 04m 12s	-11° 22.0'	8.0	11:52	17:23	22:54
NGC7027	P Neb	Cyg	21h 07m 02s	+42° 14.1'	10.0	08:45	17:26	02:06
Barnard151	DkNeb	Cep	21h 08m 13s	+56° 19.0'		Circum	17:27	Circum
IC1369	Open	Cyg	21h 12m 09s	+47° 46.1'	6.8	08:06	17:31	02:56
Barnard153	DkNeb	Cep	21h 21m 03s	+56° 26.0'		Circum	17:40	Circum

Desert Sky Observer

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November 2020

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC7076	Neb	Cep	21h 26m 24s	+62° 53.5'		Circum	17:45	Circum
NGC7078	Globular	Peg	21h 29m 58s	+12° 10.0'	6.4	11:11	17:49	00:26
M39	Open	Cyg	21h 31m 42s	+48° 25.0'	5.5	08:19	17:50	03:22
M2	Globular	Aqr	21h 33m 27s	-00° 49.3'	7.5	11:52	17:52	23:53
NGC7090	Galaxy	Ind	21h 36m 28s	-54° 33.4'	11.0	16:43	17:55	19:08
IC1396	Open	Cep	21h 38m 58s	+57° 29.3'	3.5	Circum	17:58	Circum
NGC7099	Globular	Cap	21h 40m 22s	-23° 10.7'	7.5	13:05	17:59	22:53
NGC7128	Open	Cyg	21h 43m 57s	+53° 42.9'	9.7	07:06	18:03	04:59
NGC7142	Open	Cep	21h 45m 09s	+65° 46.5'	9.3	Circum	18:04	Circum
NGC7139	P Neb	Cep	21h 46m 08s	+63° 47.5'	13.3	Circum	18:05	Circum
Barnard166	DkNeb	Cep	21h 51m 05s	+60° 05.0'		Circum	18:10	Circum
Barnard168	DkNeb	Cyg	21h 53m 20s	+47° 16.0'		08:52	18:12	03:32
IC5146	Open	Cyg	21h 53m 29s	+47° 16.0'	7.2	08:52	18:12	03:32
IC1434	Open	Lac	22h 10m 42s	+52° 51.0'	9.0	07:54	18:29	05:04
NGC7245	Open	Lac	22h 15m 11s	+54° 20.6'	9.2	07:15	18:34	05:53
NGC7232	Galaxy	Gru	22h 15m 38s	-45° 51.0'	13.0	15:30	18:34	21:38
NGC7261	Open	Cep	22h 20m 06s	+58° 03.0'	8.4	Circum	18:39	Circum
NGC7293	P Neb	Aqr	22h 29m 36s	-20° 48.0'	7.3	13:46	18:48	23:50
NGC7380	Open	Cep	22h 47m 21s	+58° 07.9'	7.2	Circum	19:06	Circum
C9	BrNeb	Cep	22h 56m 48s	+62° 37.0'		Circum	19:15	Circum
IC1470	Neb	Cep	23h 05m 10s	+60° 14.6'		Circum	19:24	Circum
NGC7492	Globular	Aqr	23h 08m 27s	-15° 36.6'	11.5	14:09	19:27	00:45
HR8872	Triple	Cep	23h 18m 38s	+68° 06.6'	4.8	Circum	19:37	Circum
IC5308	Galaxy	Gru	23h 19m 21s	-42° 15.4'	12.0	16:09	19:38	23:07
M52	Open	Cas	23h 24m 48s	+61° 35.6'	8.0	Circum	19:43	Circum
NGC7662	P Neb	And	23h 25m 54s	+42° 33.0'	8.3	11:02	19:45	04:27
NGC7686	Open	And	23h 30m 07s	+49° 08.0'	5.6	10:10	19:49	05:28
IC5332	Galaxy	Scl	23h 34m 27s	-36° 06.0'	10.6	15:50	19:53	23:56
NGC7785	Galaxy	Psc	23h 55m 19s	+05° 54.9'	11.6	13:55	20:14	02:33
HR9071	Triple	Cas	23h 59m 01s	+55° 45.3'	4.9	Circum	20:18	Circum
NGC7822	Neb	Cep	00h 03m 36s	+67° 09.0'		Circum	20:22	Circum
NGC55	S Gal	Scl	00h 14m 54s	-39° 11.0'	7.9	16:46	20:34	00:21
NGC129	Open	Cas	00h 30m 00s	+60° 13.1'	6.5	Circum	20:49	Circum
NGC133	Open	Cas	00h 31m 19s	+63° 21.0'	9.0	Circum	20:50	Circum
NGC146	Open	Cas	00h 33m 03s	+63° 18.0'	9.1	Circum	20:52	Circum
NGC147	E Gal	Cas	00h 33m 12s	+48° 30.0'	9.3	11:20	20:52	06:24
NGC190	Galaxy	Psc	00h 38m 55s	+07° 03.7'	14.0	14:35	20:58	03:20
M110	Galaxy	And	00h 40m 22s	+41° 41.1'	8.9	12:22	20:59	05:36
NGC210	Galaxy	Cet	00h 40m 35s	-13° 52.3'	10.9	15:36	20:59	02:23
NGC206	Neb	And	00h 40m 36s	+40° 44.0'		12:29	20:59	05:30

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