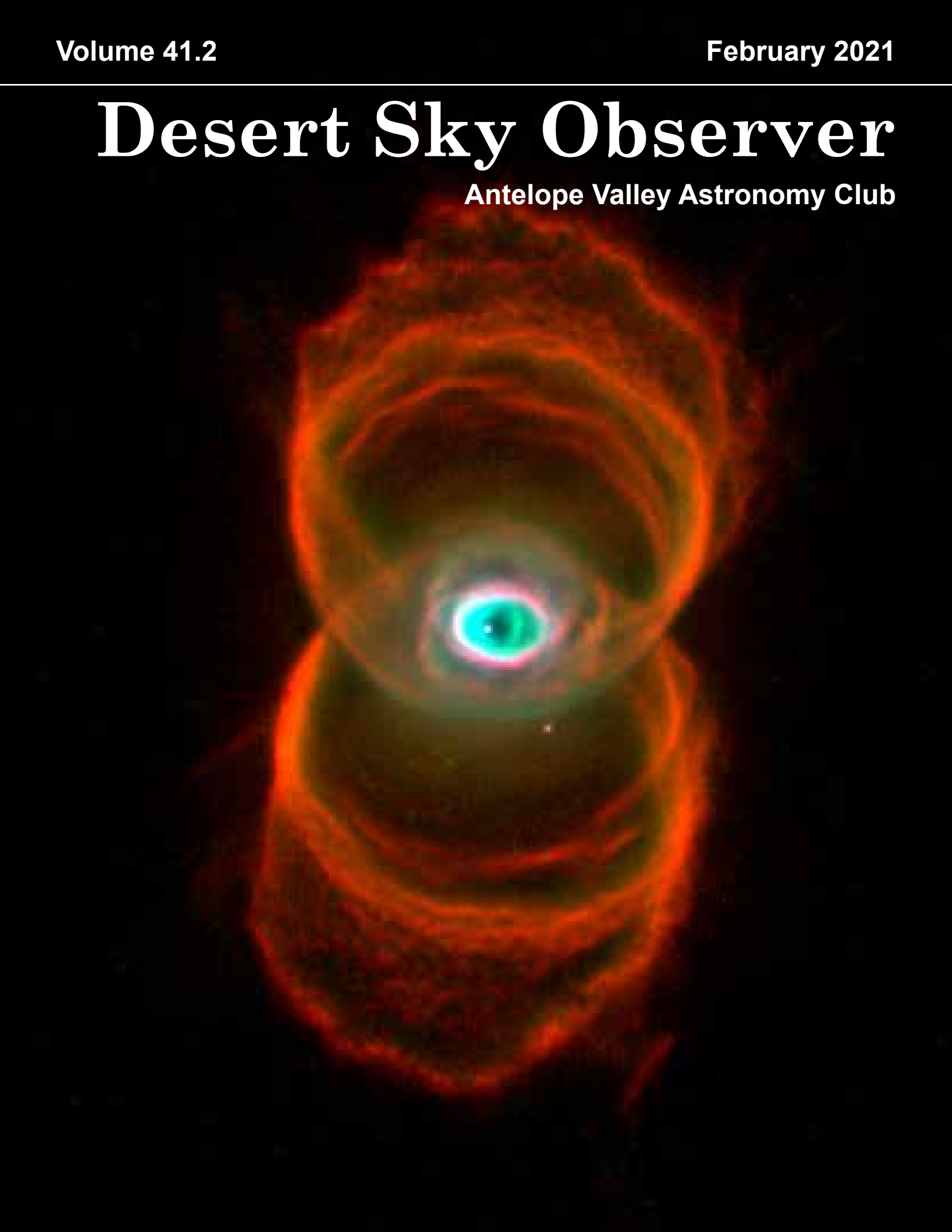
Volume 41.2 February 2021

Desert Sky Observer

Antelope Valley Astronomy Club



Upcoming Events

February 12: Club Meeting. . . via Zoom ?
watch your email for details

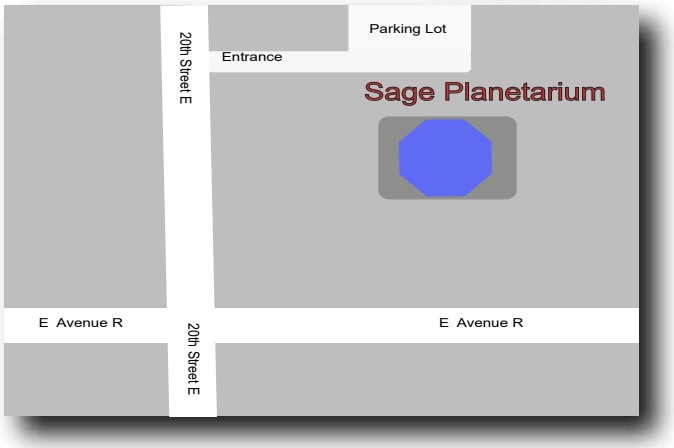
Any clear night: Personal Star Party

March 12: Club Meeting . . Maybe

March 14: Daylight Saving Time starts

April 10: Messier Marathon -- Saddlebach Butte ?

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

Well, hello everyone. I hope you are all doing great during our 11th month of this pandemic. I'm still waiting to get a call back to work at Disney. I told my wife if this is what it's like to retire, I'll work until I drop. I try to keep myself busy. I have had the itch to take my scope out into my backyard to look at one of my favorite Messier Objects, M42 in the Orion Constellation, but if it's not the clouds then it's too windy. Honestly, it's me being too lazy to drag it all out.

I was at the Sage Planetarium last month and spoke with Jeremy about doing an online club meeting for February. When it gets scheduled we will let you know by email.

On January 31, 2021, we had the Executive Board Meeting at my house to go over the calendar for this year.

The Messier Marathon will be on April 10th at Saddleback Butte, if we can get the group campsite. We will also be having two Lunar Star Parties. So check the update calendar to find out about future events.

If anyone has a special event that you would like the club to do please contact one of the Board Members and let us know what you have in mind.

So, keep looking up and stay safe.

Vice President's Corner

By Matt Leone

We are back in business, hopefully. The 12th of February we will have a meeting. I will bring up a few things to look at.

On Feb. 20, at sunrise, you can see 3 planets in the sky; Mercury, Jupiter, and Saturn will be very close together. Two of the best galaxy's are up, M81 and M82 are just above to the left of the Big Dipper; you can see them in the same view at 50 power with an eyepiece with 82° field. M42 is of course breathtaking in Orion. Don't forget to point your scope in Leo and Virgo to look at about several thousand galaxies.

Last, but not least, on February 17 you can look at the moon and see Uranus within 3 degrees, can't wait for the pictures in the magazines.

Stay safe and see you at a star party, or on line during our zoom meeting.

Matthew "Lunar" Leone.

From the Secretary

By Rose Moore

Members:

I hope all of you had a wonderful holiday season despite the guidelines and restrictions, and I hope you all are in good health!

January is the month for renewing your club memberships. If you have not done so, and want to still receive the DSO and AVAC information sent by email, please renew your membership at this time. An email with directions was sent out on Jan. 8th and 25th. If you did not receive it, please let me know and I'll send it out again. The roster for the club will be purged sometime in February. If you are currently a member, your payment is not prorated if you pay later in the year.

A Board meeting is scheduled for Jan. 31st, and plans for our 2021 calendar will be discussed. Emails will be sent out and/or events posted on the club website's calendar. Everything is tentative depending on the Covid restrictions. We are hoping to at least have a couple of star parties when the weather improves.

One of the things we will be discussing is our Messier Marathon. We'll be deciding on a date, and then will have to see where we can hold the event, again dependent on the Covid restrictions.

Our February meeting would normally be scheduled for Friday Feb. 12th. Jeremy is working on an astronomy Zoom meeting to be held on or around that date. An email will be sent out with further information when available!

Stay warm and keep looking up!

Rose

On The Cover

The Hourglass Nebula

This is an image of MyCn18, a young planetary nebula located about 8,000 light-years away, taken with the Wide Field and Planetary Camera 2 (WFPC2) aboard the Hubble Space Telescope (HST).

This Hubble image reveals the true shape of MyCn18 to be an hourglass with an intricate pattern of 'etchings' in its walls. This picture has been composed from three separate images taken in the light of ionized nitrogen (represented by red), hydrogen (green), and doubly-ionized oxygen (blue).

The results are of great interest because they shed new light on the poorly understood ejection of stellar matter which accompanies the slow death of Sun-like stars. In previous ground-based images, MyCn18 appears to be a pair of large outer rings with a smaller central one, but the fine details cannot be seen.

Credit:
Raghvendra Sahai and John Trauger (JPL), the WFPC2 science team, and NASA/ESA

To the Antelope Valley Astronomy Club,

We want to thank every single one of you for the well wishes to our family. This club was so important to Tom Hames. He actually had a dream to be apart of such a wonderful club with his best friend, Fred Ley. When Fred passed away Tom was so happy to bring their dream to life with you guys our family appreciates you all, and you will always be close to our hearts "They say home is where the heart is, mine is among the stars, across the universe."

-The Christilaw/Hames Family

It was much appreciated.

Received From Tom Hames Family

Jupiter - Saturn Conjunction
December 21, 2020

Photo by JP
12/21/2020 6:05 pm
1/4 sec f/1.5 iso 1250
Galaxy 9+ thru 10" Dob

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

A Photon checks into a hotel for the night,
The bellhop asks " Do you have any luggage?"
The photon replies " No, I'm traveling light"

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...

AVAC Membership Renewal

It is that time year again, time to renew your AVAC Membership. In a normal year I would be enjoying your company and announcing this at our January meeting, but sadly for us all this is still not a normal year. I remain hopeful that we will be able to resume our monthly meetings soon.

It is very gratifying to see the early membership renewals. Even though we are unable to have meetings, our members are still the life blood for the AVAC. And worry not, financially the club is still solvent and we are able to meet all our obligations.

Please remember that when we are able to have our monthly meetings again that our meetings are open to the public and all will be welcome. So, if for any reason you are unable to renew your membership you are still welcome to attend and we look forward to seeing you all again.

For myself the easiest way to renew my membership was through the AVAC website via our PayPal account. But you can still renew using a check via the club's Post Office Box:

Antelope Valley Astronomy Club
PO BOX 8545
Lancaster, CA 93539-8545

For members less familiar with the club's website, it is actually fairly simple:

- Google Antelope Valley Astronomy Club and then open on the link.
- Click on MEMBER and then click on LOGIN.
- The default Member Name will be your Membership Number.
- If you had Signed Up on line you would have created a Password, but if you have forgotten it, use the Forgot Password link.
- Once you have Logged In, under Member click on Profile.
- Under Profile click on Membership.
- Under Your Current Membership click on Renew Now.
- You will have the choice of paying with a PayPal account or with a Credit Card.
- If you choose Credit Card PayPal will allow you to pay as a Guest.

In my opinion renewing on the AVAC website is the best way to go. You will get an almost instant online receipt and the transaction is fully documented. And trust me, if I can do it, anyone should be able to do it also.

Thank you,
Rod Girard, AVAC Treasurer

ALMA captures distant colliding galaxy dying out as it loses the ability to form stars

Galaxies begin to "die" when they stop forming stars, but until now astronomers had never clearly glimpsed the start of this process in a far-away galaxy. Using the Atacama Large Millimeter/submillimeter Array (ALMA), in which the European Southern Observatory (ESO) is a partner, astronomers have seen a galaxy ejecting nearly half of its star-forming gas. This ejection is happening at a startling rate, equivalent to 10 000 Suns-worth of gas a year — the galaxy is rapidly losing its fuel to make new stars. The team believes that this spectacular event was triggered by a collision with another galaxy, which could lead astronomers to rethink how galaxies stop bringing new stars to life.

"This is the first time we have observed a typical massive star-forming galaxy in the distant Universe about to 'die' because of a massive cold gas ejection," says Annagrazia Puglisi, lead researcher on the new study, from the Durham University, UK, and the Saclay Nuclear Research Centre (CEA-Saclay), France. The galaxy, ID2299, is distant enough that its light takes some 9 billion years to reach us; we see it when the Universe was just 4.5 billion years old.

The gas ejection is happening at a rate equivalent to 10 000 Suns per year, and is removing an astonishing 46% of the total cold gas from ID2299. Because the galaxy is also forming stars very rapidly, hundreds of times faster than our Milky Way, the remaining gas will be quickly consumed, shutting down ID2299 in just a few tens of million years.

The event responsible for the spectacular gas loss, the team believes, is a collision between two galaxies, which eventually merged to form ID2299. The elusive clue that pointed the scientists towards this scenario was the association of the ejected gas with a "tidal tail". Tidal tails are elongated streams of stars and gas extending into interstellar space that result when two galaxies merge, and they are usually too faint to see in distant galaxies. However, the team managed to observe the relatively bright feature just as it was launching into space, and were able to identify it as a tidal tail.

Most astronomers believe that winds caused by star formation and the activity of black holes at the centres of massive galaxies are responsible for launching star-forming material into space, thus ending galaxies' ability to make new stars. However, the new study published today in Nature Astronomy suggests that galactic mergers can also be responsible for ejecting star-forming fuel into space.

"Our study suggests that gas ejections can be produced by mergers and that winds and tidal tails can appear very similar," says study co-author Emanuele Daddi of CEA-Saclay. Because of this, some of the teams that previously identified winds from distant galaxies could in fact have been observing tidal tails ejecting gas from them. "This might lead us to revise our understanding of how galaxies 'die'," Daddi adds.

Puglisi agrees about the significance of the team's finding, saying: "I was thrilled to discover such an exceptional galaxy! I was eager to learn more about this weird object because I was convinced that there was some important lesson to be learned about how distant galaxies evolve."

This surprising discovery was made by chance, while the team were inspecting a survey of galaxies made with ALMA, designed to study the properties of cold gas in more than 100 far-away galaxies. ID2299 had been observed by ALMA for only a few minutes, but the powerful observatory, located in northern Chile, allowed the team to collect enough data to detect the galaxy and its ejection tail.

"ALMA has shed new light on the mechanisms that can halt the formation of stars in distant galaxies. Witnessing such a massive disruption event adds an important piece to the complex puzzle of galaxy evolution," says Chiara Circosta, a researcher at the University College London, UK, who also contributed to the research.

In the future, the team could use ALMA to make higher-resolution and deeper observations of this galaxy, enabling them to better understand the dynamics of the ejected gas. Observations with the future ESO's Extremely Large Telescope could allow the team to explore the connections between the stars and gas in ID2299, shedding new light on how galaxies evolve.

This research was presented in the paper "A titanic interstellar medium ejection from a massive starburst galaxy at z=1.4" to appear in Nature Astronomy (doi: 10.1038/s41550-020-01268-x).

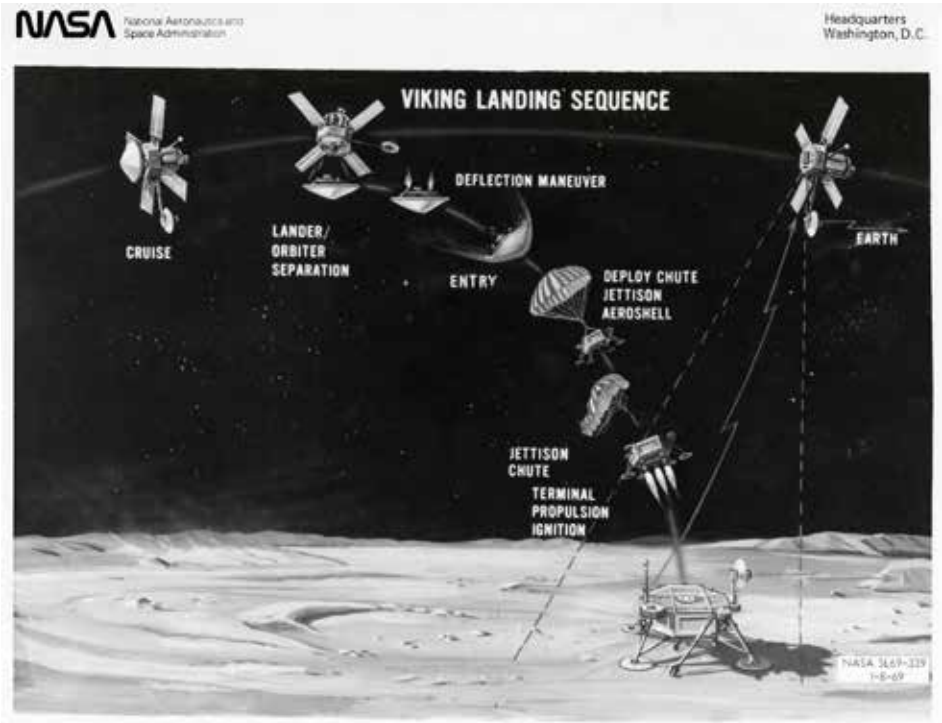
Landing On Mars: A Tricky Feat! by David Prosper

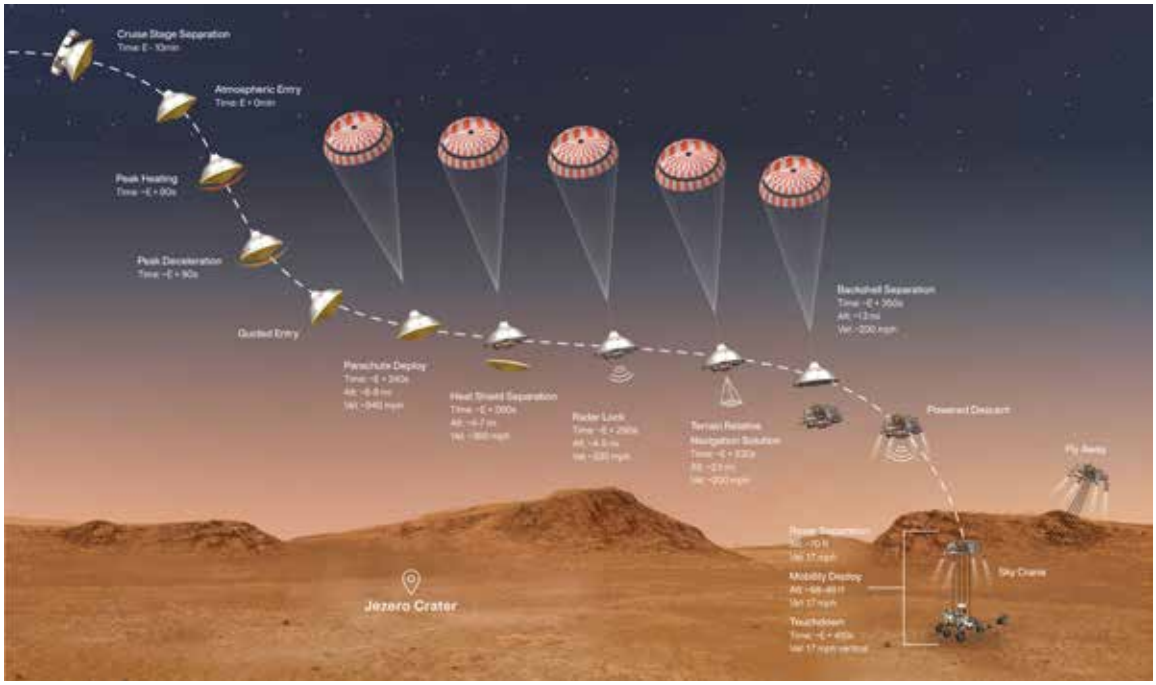
The Perseverance rover and Ingenuity helicopter will land in Mars's Jezero crater on February 18, 2021, NASA's latest mission to explore the red planet. Landing on Mars is an incredibly difficult feat that has challenged engineers for decades: while missions like Curiosity have succeeded, its surface is littered with the wreckage of many failures as well. Why is landing on Mars so difficult?

Mars presents a unique problem to potential landers as it possesses a relatively large mass and a thin, but not insubstantial, atmosphere. The atmosphere is thick enough that spacecraft are stuffed inside a streamlined aeroshell sporting a protective heat shield to prevent burning up upon entry - but that same atmosphere is not thick enough to rely on parachutes alone for a safe landing, since they can't catch sufficient air to slow down quickly enough. This is even worse for larger explorers like Perseverance, weighing in at 2,260 lbs (1,025 kg). Fortunately, engineers have crafted some ingenious landing methods over the decades to allow their spacecraft to survive what is called Entry, Descent, and Landing (EDL).

The Viking landers touched down on Mars in 1976 using heat shields, parachutes, and retrorockets. Despite using large parachutes, the large Viking landers fired retrorockets at the end to land at a safe speed. This complex combination has been followed by almost every mission since, but subsequent missions have innovated in the landing segment. The 1997 Mars Pathfinder mission added airbags in conjunction with parachutes and retrorockets to safely bounce its way to a landing on the Martian surface. Then three sturdy "petals" ensured the lander was pushed into an upright position after landing on an ancient floodplain. The Opportunity and Spirit missions used a very similar method to place their rovers on the Martian surface in 2004. Phoenix (2008) and Insight (2018) actually utilized Viking-style landings. The large and heavy Curiosity rover required extra power at the end to safely land the car-sized rover, and so the daring "Sky Crane" deployment system was successfully used in 2012. After an initial descent using a massive heat shield and parachute, powerful retrorockets finished slowing down the spacecraft to about 2 miles per hour. The Sky Crane then safely lowered the rover down to the Martian surface using a strong cable. Its job done, the Sky Crane then flew off and crash-landed a safe distance away. Having proved the efficacy of the Sky Crane system, NASA will use this same method to attempt a
safe landing for Perseverance this month!

You can watch coverage of the Mars Perseverance landing starting at 11:00 AM PST (2:00 PM EST) on February 18 at nasa.gov/nasalive. Touchdown is expected around 12:55 PM PST (3:55 PM EST). NASA has great resources about the Perseverance Rover and accompanying Ingenuity helicopter on mars.nasa.gov/mars2020 . And of course, find out how we plan to land on many different worlds at nasa.gov.





Illustrations of the Entry, Descent, and Landing (EDL) sequences for Viking in 1976, and Perseverance in 2021. Despite the wide gap between these missions in terms of technology, they both performed their landing maneuvers automatically, since our planets are too far apart to allow Earth-based engineers to control them in real time! (NASA/JPL/Caltech)

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!

Space News

News from around the Net

Unique Solar System Views from NASA Sun-Studying Missions

Though they focus on the star at the center of our solar system, three of NASA's Sun-watching spacecraft have captured unique views of the planets throughout the last several months. Using instruments that look not at the Sun itself, but at the constant outflow of solar material from the Sun, the missions — ESA and NASA's Solar Orbiter, NASA's Parker Solar Probe, and NASA's Solar and Terrestrial Relations Observatory — have sent home images from their distinct vantage points across the inner solar system. . . (continued at https://www.nasa.gov/feature/goddard/2021/unique-solar-system-views-from-nasa-sun-studying-missions)

Solar And Lunar Eclipses In 2021

Four eclipses occur in 2021, with annular and total solar eclipses alternating between total and not-quite-total lunar eclipses. Up to seven eclipses of the Sun and Moon can take place in one year, though the last time that happened was 1982, and the fewest possible is four. That latter, minimalist mix is in play for 2021 — but it's a good assortment. The two solar eclipses will be "central" events (annular in June and total in December). Meanwhile, in May we'll witness our first total lunar eclipse since January 2019, and the one that follows in November just misses being total. . .(continued at https://skyandtelescope.org/observing/solar-and-lunar-eclipses-in-2021/)

Starlink Satellites Are Fainter Now — But Still Visible

Measurements of Starlink's "VisorSat" show SpaceX has succeeded in making a less reflective satellite. But it's still visible from dark-sky areas. The first launch of Starlink satellites two years ago alarmed many amateur and professional astronomers. Lone satellites coursing through the night sky are commonplace, but in May 2019 observers witnessed an unprecedented parade of startlingly bright objects marching across the heavens. . . (continued at https://skyandtelescope.org/astronomy-news/starlink-satellites-fainter-but-still-visible/)

Turns Out, You *Can* Get Something Out Of A Black Hole... But It's Not Easy

One of the defining characteristics of a black hole is that nothing can come out of them. That's why they're named such; they're like an infinitely deep pit, and not even light can escape. A hole that's black. But, like so many ideas in science, when you take a closer look, that absolute statement becomes a bit relative. . .(continued at https://www.syfy.com/syfywire/magnetic-fields-can-drain-energy-out-of-black-holes)

Image: Hubble takes portrait of the 'Lost Galaxy'

Located in the constellation of Virgo (The Virgin), around 50 million light-years from Earth, the galaxy NGC 4535 is truly a stunning sight to behold. Despite the incredible quality of this image, taken from the NASA/ESA Hubble Space Telescope, NGC 4535 has a hazy, somewhat ghostly, appearance when viewed from a smaller telescope. This led amateur astronomer Leland S. Copeland to nickname NGC 4535 the "Lost Galaxy" in the 1950s. . . .(continued at https://phys.org/news/2021-01-image-hubble-portrait-lost-galaxy.html)

Space News

News from around the Net. . .continued

First Evidence That Water Can Be Created On The Lunar Surface By Earth's Magnetosphere

Before the Apollo era, the moon was thought to be dry as a desert due to the extreme temperatures and harshness of the space environment. Many studies have since discovered lunar water: ice in shadowed polar craters, water bound in volcanic rocks, and unexpected rusty iron deposits in the lunar soil. Despite these findings, there is still no true confirmation of the extent or origin of lunar surface water. . . (continued at https://phys.org/news/2021-01-evidence-lunar-surface-earth-magnetosphere.html)

NASA's Roman Mission Will Probe Galaxy's Core For Hot Jupiters, Brown Dwarfs

When it launches in the mid-2020s, NASA's Nancy Grace Roman Space Telescope will explore an expansive range of infrared astrophysics topics. One eagerly anticipated survey will use a gravitational effect called microlensing to reveal thousands of worlds that are similar to the planets in our solar system. Now, a new study shows that the same survey will also unveil more extreme planets and planet-like bodies in the heart of the Milky Way galaxy, thanks to their gravitational tug on the stars they orbit. . . (continued at https://phys.org/news/2021-01-nasa-roman-mission-probe-galaxy.html)

New galaxy sheds light on how stars form

A lot is known about galaxies. We know, for instance, that the stars within them are shaped from a blend of old star dust and molecules suspended in gas. What remains a mystery, however, is the process that leads to these simple elements being pulled together to form a new star. But now an international team of scientists, including astrophysicists from the University of Bath in the UK and the National Astronomical Observatory (OAN) in Madrid, Spain have taken a significant step towards understanding how a galaxy's gaseous content becomes organised into a new generation of stars. . . (continued at https://www.sciencedaily.com/releases/2021/01/210125113116.htm)

The Seven Rocky Planets Of TRAPPIST-1 Seem To Have Very Similar Compositions

A new international study led by astrophysicist Eric Agol from the University of Washington has measured the densities of the seven planets of the exoplanetary system TRAPPIST-1 with extreme precision, the values obtained indicating very similar compositions for all the planets. This fact makes the system even more remarkable and helps to better understand the nature of these fascinating worlds. . . (continued at https://www.sciencedaily.com/releases/2021/01/210122112313.htm)

Spacewalking astronauts tackle European lab upgrade at space station

Two spacewalking astronauts faced down and fixed numerous technical glitches during a busy spacewalk Wednesday (Jan. 27), but couldn't quite finish upgrading a European science platform on the International Space Station (ISS). NASA astronauts Mike Hopkins and Victor Glover spent nearly seven hours spacewalking outside the station to work on the Bartolomeo external science platform on the European Space Agency's Columbus module.. . (continued at https://www.space.com/space-station-astronauts-spacewalk-european-science-platform-jan-27-2021)

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).

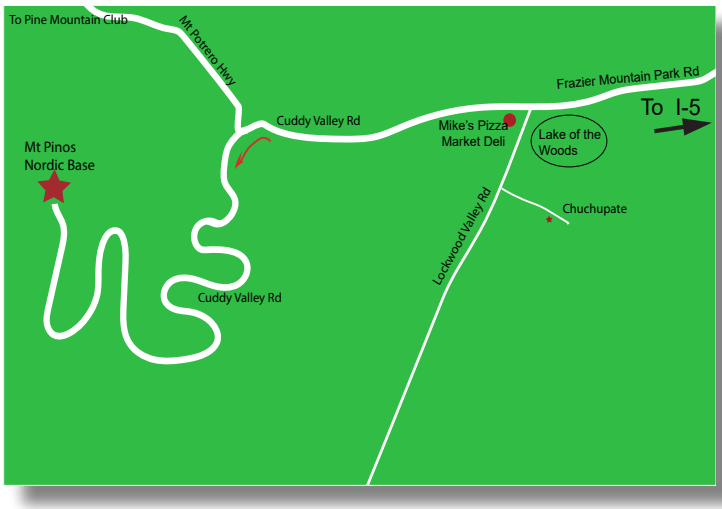
To get there, take the Frazier Mountain Park RD east about 7 miles from I-5, to Lake Of The Woods, Turn left on Lockwood Valley Rd. (If you see Mike's Pizza on your left you missed the turn) In less than a mile there is a road to the left, go past the ranger station, the parking lot is on the right. 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 February in Capricorn and crosses into Aquarius by the end of the month.

Mercury dives toward the glare of the evening Sun achieving inferior conjunction on the 8th, returning to the morning sky late in the month.

Venus starts the month in Capricorn falling toward the Sun, ending the month in eastern Aquarius at a mag of -3.91. Say good-bye till early May when it reemerges in the evening twilight.

Mars starts the month in Aries slowly moving east into Taurus. On the 18th the 44% waxing Moon passes 3.6° to its south. On the 3rd of March Mars passes less than 3° south of the Pleidades (M45).

Jupiter following the conjunction with the Sun emerges into the morning twilight late in the month. On the 11th Venus flies by 0°25' to the south with the Sun 10° to the east.

Saturn after the solar conjunction with the Sun in January emerges from the solar glare in the morning twilight. On the 6th just 11° west of the Sun, Venus slides by 0°22' to the south.

Uranus will spend the month in southern Aries at magnitude 5.8. Mars slides past 1.3° to the north on the 20th.

Neptune will spend the month stationary in northeast Aquarius at mag 7.8. The new Moon will pass 4.5° south on the 13th.

Pluto spends the month in Sagittarius at mag 14 . The Sun is in front of Pluto almost the entire month. By the 28th slides past Venus by 0°44'.

Sun and Moon Rise and Set

First Qtr Feb 19 | Full Feb 27 | Third Qtr Feb 4 | New Feb 11

Sun and Moon Rise and Set*

Date	Moonrise	Moonset	Sunrise	Sunset
2/1/2021	21:49	09:33	06:50	17:22
2/5/2021	01:13	11:51	06:47	17:26
2/10/2021	06:18	16:32	06:42	17:31
2/15/2021	09:01	21:33	06:37	17:36
2/20/2021	11:33	01:19	06:32	17:40
2/25/2021	16:10	05:41	06:26	17:45

Planet Data*

Feb 1

	Rise	Transit	Set	Mag	Phase%
Mercury	07:22	12:53	18:25	-1.56	13.8
Venus	06:12	11:14	16:17	-3.91	97.7
Mars	10:53	17:44	00:37	0.47	88.6
Jupiter	06:46	11:55	17:05	-1.95	100.
Saturn	06:29	11:35	16:41	0.62	100.

Feb 15

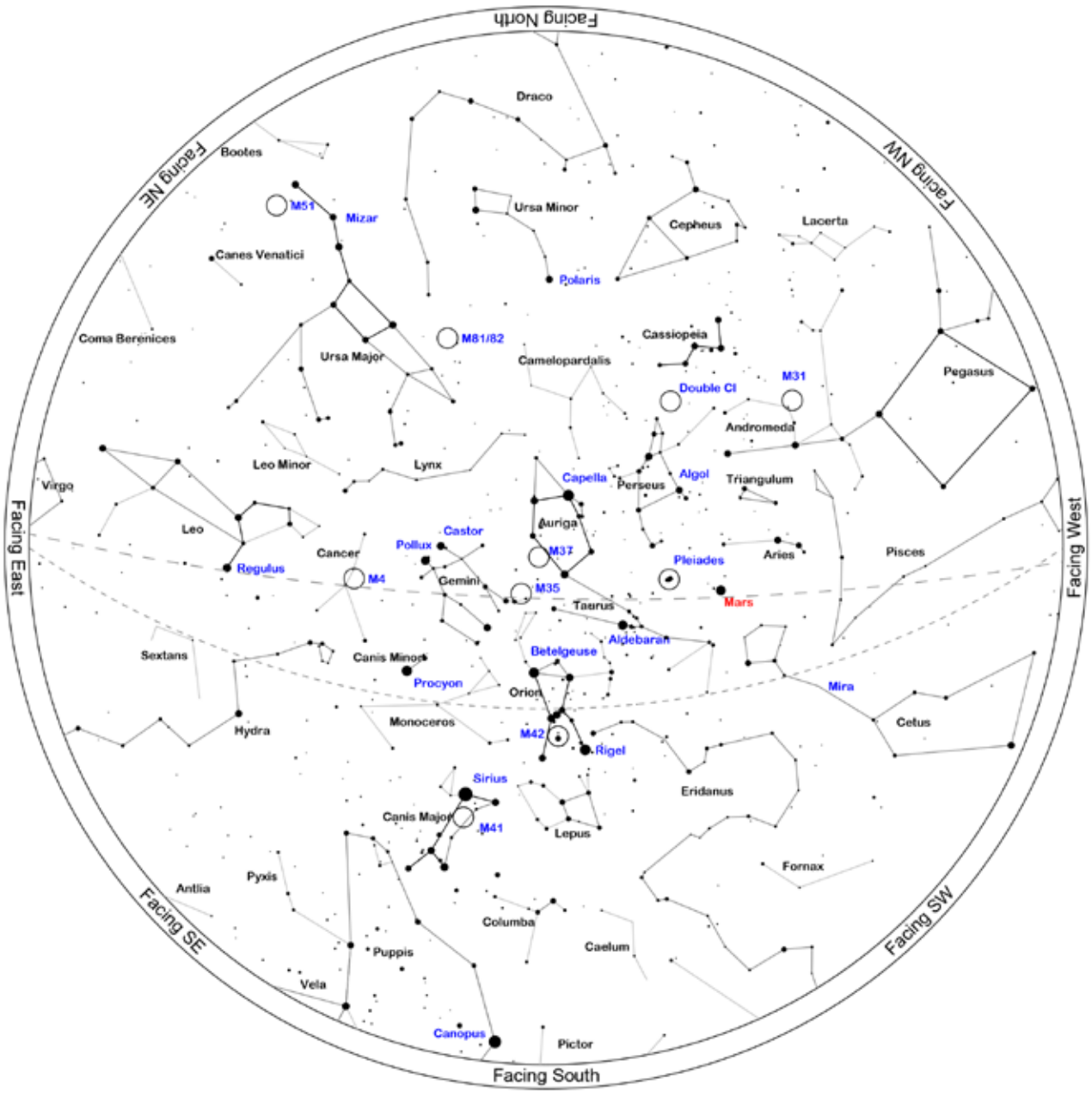
	Rise	Transit	Set	Mag	Phase%
Mercury	05:43	11:06	16:27	1.80	13.9
Venus	06:16	11:31	16:47	-3.91	98.7
Mars	10:21	17:20	00:19	0.71	89.0
Jupiter	06:01	11:14	16:26	-1.97	99.9
Saturn	05:40	10:47	15:54	0.67	99.9

Feb 28

	Rise	Transit	Set	Mag	Phase%
Mercury	05:06	10:23	15:39	0.28	47.2
Venus	06:12	11:43	17:15	-3.91	99.4
Mars	09:54	16:59	00:05	0.91	89.6
Jupiter	05:19	10:35	15:50	-1.99	99.8
Saturn	04:53	10:02	15:10	0.71	99.9.

*Sun, Moon and Planetary date based on Quartz Hill, CA. All Times Local.

Sky Chart



Location: Palmdale, CA 93551
Latitude: 34° 36' N, longitude: 118° 11' W
Time: 2021 February 13, 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 February 13, 2021. The list is sorted by the transit time of the object.

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1052	Galaxy	Cet	02h 41m 05s	-08° 15.3'	10.6	11:21	17:01	22:41
M34	Open	Per	02h 42m 05s	+42° 45.6'	6.0	08:18	17:02	01:46
M77	Galaxy	Cet	02h 42m 41s	-00° 00.8'	9.7	11:00	17:03	23:05
NGC1084	Galaxy	Eri	02h 46m 00s	-07° 34.6'	10.6	11:24	17:06	22:48
IC1848	Open	Cas	02h 51m 18s	+60° 24.4'	6.5	Circum	17:11	Circum
NGC1156	Galaxy	Ari	02h 59m 42s	+25° 14.2'	11.7	10:00	17:20	00:39
NGC1201	Galaxy	For	03h 04m 08s	-26° 04.1'	10.6	12:40	17:24	22:08
NGC1175	Galaxy	Per	03h 04m 32s	+42° 20.3'	12.8	08:43	17:24	02:05
HR963	Dbl	For	03h 12m 04s	-28° 59.2'	3.9	12:59	17:32	22:05
NGC1316	Galaxy	For	03h 22m 42s	-37° 12.4'	8.9	13:45	17:43	21:40
Barnard202	DkNeb	Ari	03h 25m 38s	+30° 16.0'		10:07	17:45	01:24
Barnard204	DkNeb	Ari	03h 28m 29s	+30° 11.0'		10:10	17:48	01:27
NGC1350	Galaxy	For	03h 31m 08s	-33° 37.7'	10.5	13:37	17:51	22:05
Barnard1	DkNeb	Per	03h 32m 57s	+31° 09.0'		10:10	17:53	01:35
Barnard2	DkNeb	Per	03h 33m 31s	+32° 19.0'		10:06	17:53	01:41
Barnard3	DkNeb	Per	03h 40m 01s	+31° 58.0'		10:14	18:00	01:46
NGC1407	Galaxy	Eri	03h 40m 12s	-18° 34.8'	9.8	12:51	18:00	23:09
IC347	Galaxy	Eri	03h 42m 32s	-04° 17.9'	13.0	12:12	18:02	23:53
NGC1448	Galaxy	Hor	03h 44m 32s	-44° 38.6'	11.0	14:51	18:04	21:17
IC348	Open	Per	03h 44m 34s	+32° 09.7'	7.3	10:18	18:04	01:51
M45	Open	Tau	03h 47m 30s	+24° 07.0'	1.6	10:52	18:07	01:23
Barnard5	DkNeb	Per	03h 47m 53s	+32° 53.0'		10:18	18:08	01:58
NGC1461	Galaxy	Eri	03h 48m 27s	-16° 23.5'	11.7	12:52	18:08	23:24
IC353	Neb	Tau	03h 53m 00s	+25° 48.0'		10:52	18:13	01:34
IC2003	P Neb	Per	03h 56m 22s	+33° 52.5'	13.0	10:22	18:16	02:11
NGC1499	Neb	Per	04h 03m 14s	+36° 22.0'		10:17	18:23	02:29
NGC1515	Galaxy	Dor	04h 04m 03s	-54° 06.0'	11.0	17:00	18:24	19:47
NGC1496	Open	Per	04h 04m 32s	+52° 39.7'	10.0	07:53	18:24	04:56
NGC1502	Open	Cam	04h 07m 50s	+62° 19.8'	5.7	Circum	18:28	Circum
IC360	Neb	Tau	04h 09m 00s	+26° 06.0'		11:06	18:29	01:51
NGC1514	P Neb	Tau	04h 09m 17s	+30° 46.5'	10.0	10:48	18:29	02:10
NGC1513	Open	Per	04h 09m 57s	+49° 30.8'	8.4	08:46	18:30	04:13
IC359	Neb	Tau	04h 12m 28s	+27° 42.1'		11:04	18:32	02:01
NGC1535	P Neb	Eri	04h 14m 16s	-12° 44.3'	10.0	13:07	18:34	00:01
Barnard10	DkNeb	Tau	04h 18m 41s	+28° 16.0'		11:08	18:39	02:09
NGC1545	Open	Per	04h 20m 57s	+50° 15.2'	6.2	08:48	18:41	04:34

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC1569	Galaxy	Cam	04h 30m 49s	+64° 50.8'	11.2	Circum	18:51	Circum
Barnard18	DkNeb	Tau	04h 31m 13s	+24° 21.0'		11:35	18:51	02:07
NGC1582	Open	Per	04h 31m 53s	+43° 49.0'	7.0	10:00	18:52	03:43
NGC1560	Galaxy	Cam	04h 32m 48s	+71° 52.7'	11.5	Circum	18:53	Circum
Barnard19	DkNeb	Tau	04h 33m 00s	+26° 16.0'		11:30	18:53	02:16
Barnard20	DkNeb	Per	04h 37m 04s	+50° 58.0'		08:54	18:57	04:59
Barnard22	DkNeb	Tau	04h 38m 00s	+26° 03.0'		11:36	18:58	02:20
Barnard14	DkNeb	Tau	04h 39m 59s	+25° 44.0'		11:39	19:00	02:21
IC2087	Neb	Tau	04h 40m 00s	+25° 44.5'		11:39	19:00	02:21
Barnard23	DkNeb	Tau	04h 40m 33s	+29° 52.0'		11:23	19:00	02:37
NGC1624	Open	Per	04h 40m 36s	+50° 27.6'	10.4	09:05	19:00	04:56
NGC1640	Galaxy	Eri	04h 42m 14s	-20° 26.0'	11.7	13:59	19:02	00:05
NGC1647	Open	Tau	04h 45m 55s	+19° 06.8'	6.4	12:07	19:06	02:04
IC2118	Neb	Eri	05h 04m 54s	-07° 15.0'		13:42	19:25	01:07
NGC1851	Globular	Col	05h 14m 06s	-40° 03.0'	7.3	15:52	19:34	23:16
IC405	Neb	Aur	05h 16m 29s	+34° 21.3'		11:40	19:36	03:33
M79	Globular	Lep	05h 24m 11s	-24° 31.4'	8.5	14:54	19:44	00:34
M38	Open	Aur	05h 28m 40s	+35° 50.8'	7.0	11:45	19:49	03:52
M1	SNR	Tau	05h 34m 32s	+22° 00.8'	8.4	12:46	19:54	03:02
M42	Open+D Neb	Ori	05h 35m 16s	-05° 23.4'	4.0	14:07	19:55	01:43
M43	D Neb	Ori	05h 35m 31s	-05° 16.0'	9.0	14:07	19:55	01:44
M36	Open	Aur	05h 36m 18s	+34° 08.3'	6.5	12:01	19:56	03:52
M78	D Neb	Ori	05h 46m 45s	+00° 04.8'	8.0	14:04	20:07	02:10
M37	Open	Aur	05h 52m 18s	+32° 33.2'	6.0	12:24	20:12	04:01
M35	Open	Gem	06h 09m 00s	+24° 21.0'	5.5	13:13	20:29	03:45
M41	Open	CMa	06h 46m 01s	-20° 45.3'	5.0	16:04	21:06	02:08
M50	Open	Mon	07h 02m 42s	-08° 23.0'	7.0	15:43	21:23	03:02
M47	Open	Pup	07h 36m 35s	-14° 29.0'	4.5	16:35	21:56	03:18
M46	Open	Pup	07h 41m 46s	-14° 48.6'	6.5	16:41	22:02	03:22
M93	Open	Pup	07h 44m 30s	-23° 51.4'	6.5	17:12	22:04	02:56
M48	Open	Hya	08h 13m 43s	-05° 45.0'	5.5	16:47	22:34	04:20
M44	Open	Cnc	08h 40m 24s	+19° 40.0'	4.0	16:00	23:00	06:00
M67	Open	Cnc	08h 51m 18s	+11° 48.0'	7.5	16:35	23:11	05:47
M81	Galaxy	UMa	09h 55m 33s	+69° 03.9'	7.8	Circum	00:15	Circum
M82	Galaxy	UMa	09h 55m 53s	+69° 40.8'	9.2	Circum	00:16	Circum
M95	Galaxy	Leo	10h 43m 58s	+11° 42.2'	10.6	18:28	01:04	07:40
M96	Galaxy	Leo	10h 46m 46s	+11° 49.2'	10.1	18:31	01:07	07:43
M105	Galaxy	Leo	10h 47m 50s	+12° 34.9'	10.5	18:29	01:08	07:46
M108	Galaxy	UMa	11h 11m 31s	+55° 40.4'	10.6	Circum	01:31	Circum
M97	P Neb	UMa	11h 14m 48s	+55° 01.1'	12.0	Circum	01:35	Circum
M65	Galaxy	Leo	11h 18m 56s	+13° 05.5'	10.1	18:59	01:39	08:19

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
M66	Galaxy	Leo	11h 20m 15s	+12° 59.4'	9.7	19:01	01:40	08:20
M109	Galaxy	UMa	11h 57m 36s	+53° 22.4'	10.6	15:30	02:17	13:05
M98	Galaxy	Com	12h 13m 48s	+14° 54.0'	10.9	19:48	02:34	09:19
M99	Galaxy	Com	12h 18m 50s	+14° 25.0'	10.4	19:55	02:39	09:23
M106	Galaxy	CVn	12h 18m 58s	+47° 18.2'	9.1	17:19	02:39	11:59
M61	Galaxy	Vir	12h 21m 55s	+04° 28.3'	10.1	20:27	02:42	08:57
M40	Dbl+Asterism	UMa	12h 22m 12s	+58° 05.0'	8.7	Circum	02:42	Circum
M100	Galaxy	Com	12h 22m 55s	+15° 49.3'	10.1	19:55	02:43	09:31
M84	Galaxy	Vir	12h 25m 04s	+12° 53.2'	10.2	20:06	02:45	09:24
M85	Galaxy	Com	12h 25m 24s	+18° 11.4'	10.0	19:50	02:45	09:41
M86	Galaxy	Vir	12h 26m 12s	+12° 56.7'	9.9	20:07	02:46	09:25
M49	Galaxy	Vir	12h 29m 47s	+08° 00.0'	9.3	20:25	02:50	09:15
M87	Galaxy	Vir	12h 30m 49s	+12° 23.4'	9.6	20:13	02:51	09:28
M88	Galaxy	Com	12h 31m 59s	+14° 25.2'	10.2	20:08	02:52	09:36
M91	Galaxy	Com	12h 35m 27s	+14° 29.7'	10.9	20:11	02:55	09:39
M89	Galaxy	Vir	12h 35m 40s	+12° 33.3'	10.9	20:17	02:56	09:34
M90	Galaxy	Vir	12h 36m 50s	+13° 09.7'	10.2	20:17	02:57	09:37
M58	Galaxy	Vir	12h 37m 44s	+11° 49.1'	10.4	20:21	02:58	09:34
M68	Globular	Hya	12h 39m 28s	-26° 44.5'	9.0	22:18	02:59	07:41
M104	Galaxy	Vir	12h 39m 59s	-11° 37.3'	9.2	21:30	03:00	08:30
M59	Galaxy	Vir	12h 42m 02s	+11° 38.7'	10.7	20:26	03:02	09:38
M60	Galaxy	Vir	12h 43m 40s	+11° 33.1'	9.8	20:28	03:04	09:39
M94	Galaxy	CVn	12h 50m 53s	+41° 07.1'	8.9	18:38	03:11	11:44
M64	Galaxy	Com	12h 56m 44s	+21° 41.0'	9.3	20:10	03:17	10:23
M53	Globular	Com	13h 12m 55s	+18° 10.1'	8.5	20:37	03:33	10:28
M63	Galaxy	CVn	13h 15m 49s	+42° 01.7'	9.3	18:57	03:36	12:15
NGC5139	Globular	Cen	13h 26m 48s	-47° 29.0'	3.6	00:56	03:47	06:37
NGC5169	Galaxy	CVn	13h 28m 10s	+46° 40.3'	14.0	18:34	03:48	13:02
NGC5204	Galaxy	UMa	13h 29m 36s	+58° 25.1'	11.3	Circum	03:49	Circum
M51	Galaxy	CVn	13h 29m 52s	+47° 11.7'	8.9	18:30	03:50	13:09
Arp85	Galaxy	CVn	13h 29m 58s	+47° 16.0'	9.6	18:30	03:50	13:10
NGC5182	Galaxy	Hya	13h 30m 41s	-28° 09.0'	13.0	23:14	03:51	08:27
NGC5214	Galaxy	CVn	13h 32m 49s	+41° 52.3'	14.0	19:15	03:53	12:31
M83	Galaxy	Hya	13h 37m 00s	-29° 51.8'	8.0	23:27	03:57	08:27
HR5144	Triple	Boo	13h 40m 40s	+19° 57.3'	5.8	20:59	04:01	11:02
NGC5283	Galaxy	Dra	13h 41m 06s	+67° 40.3'	14.0	Circum	04:01	Circum
M3	Globular	CVn	13h 42m 11s	+28° 22.5'	7.0	20:31	04:02	11:33
NGC5286	Globular	Cen	13h 46m 24s	-51° 22.0'	7.6	01:57	04:06	06:15
NGC5292	Galaxy	Cen	13h 47m 40s	-30° 56.4'	14.0	23:42	04:08	08:33
NGC5356	Galaxy	Vir	13h 54m 59s	+05° 20.0'	14.0	21:57	04:15	10:32

ID	Type	Const	RA	Dec	Mag	Rise	Transit	Set
NGC5363	Galaxy	Vir	13h 56m 07s	+05° 15.2'	10.2	21:59	04:16	10:33
NGC5447	Neb	UMa	14h 02m 29s	+54° 16.3'		17:07	04:22	15:38
M101	Galaxy	UMa	14h 03m 13s	+54° 20.9'	8.2	17:04	04:23	15:42
NGC5461	Neb	UMa	14h 03m 42s	+54° 19.0'		17:06	04:24	15:41
NGC5485	Galaxy	UMa	14h 07m 11s	+55° 00.0'	11.5	Circum	04:27	Circum
NGC5460	Open	Cen	14h 07m 27s	-48° 20.6'	5.6	01:45	04:27	07:10
NGC5500	Galaxy	Boo	14h 10m 15s	+48° 32.7'	14.0	18:57	04:30	14:03
IC991	Galaxy	Vir	14h 17m 48s	-13° 52.3'	13.0	23:14	04:38	10:01
HR5362	Dbl	Lup	14h 20m 10s	-43° 03.5'	5.6	01:16	04:40	08:04
IC4406	P Neb	Lup	14h 22m 26s	-44° 09.0'	11.0	01:26	04:42	07:59
HR5409	Triple	Vir	14h 28m 12s	-02° 13.6'	4.8	22:51	04:48	10:45
NGC5669	Galaxy	Boo	14h 32m 44s	+09° 53.4'	12.0	22:22	04:53	11:23
NGC5689	Galaxy	Boo	14h 35m 30s	+48° 44.5'	11.9	19:20	04:55	14:30
M102	Galaxy	Dra	15h 06m 30s	+55° 45.7'	10.8	Circum	05:26	Circum
NGC5875	Galaxy	Boo	15h 09m 13s	+52° 31.6'	13.0	19:01	05:29	15:58
NGC5907	Galaxy	Dra	15h 15m 54s	+56° 19.7'	11.4	Circum	05:36	Circum
NGC5882	P Neb	Lup	15h 16m 50s	-45° 38.9'	11.0	02:31	05:37	08:42
NGC5897	Globular	Lib	15h 17m 24s	-21° 00.6'	8.6	00:36	05:37	10:39
M5	Globular	Ser	15h 18m 33s	+02° 04.9'	7.0	23:30	05:38	11:47
Barnard228	DkNeb	Lup	15h 44m 00s	-34° 30.0'		01:54	06:04	10:14
IC4593	P Neb	Her	16h 11m 44s	+12° 04.3'	11.0	23:55	06:32	13:08
IC4592	Neb	Sco	16h 11m 59s	-19° 27.4'		01:25	06:32	11:38
M80	Globular	Sco	16h 17m 03s	-22° 58.5'	8.5	01:42	06:37	11:32
IC4601	Neb	Sco	16h 20m 18s	-20° 04.9'		01:36	06:40	11:45
Abell38	P Neb	Sco	16h 23m 17s	-31° 44.9'	11.7	02:21	06:43	11:05
M4	Globular	Sco	16h 23m 35s	-26° 31.5'	7.5	02:01	06:43	11:26
IC4603	Neb	Oph	16h 25m 24s	-24° 28.0'		01:55	06:45	11:35
IC4604	Neb	Oph	16h 25m 33s	-23° 26.5'		01:52	06:45	11:39
NGC6124	Open	Sco	16h 25m 36s	-40° 40.0'	5.8	03:07	06:45	10:24
Abell39	P Neb	Her	16h 27m 33s	+27° 54.5'	12.9	23:18	06:47	14:17
IC4605	Neb	Sco	16h 30m 12s	-25° 06.8'		02:02	06:50	11:38
NGC6153	P Neb	Sco	16h 31m 31s	-40° 15.2'	12.0	03:10	06:51	10:33
NGC6181	Galaxy	Her	16h 32m 21s	+19° 49.5'	11.9	23:51	06:52	13:53
NGC6171	Globular	Oph	16h 32m 32s	-13° 03.1'	8.1	01:26	06:52	12:18
NGC6178	Open	Sco	16h 35m 47s	-45° 38.6'	7.2	03:50	06:56	10:01
NGC6193	Open	Ara	16h 41m 18s	-48° 46.0'	5.2	04:23	07:01	09:40
M13	Globular	Her	16h 41m 41s	+36° 27.5'	7.0	22:55	07:02	15:08
NGC6210	P Neb	Her	16h 44m 30s	+23° 48.0'	9.0	23:50	07:04	14:19
Barnard44a	DkNeb	Sco	16h 44m 45s	-40° 20.0'		03:24	07:05	10:45

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