

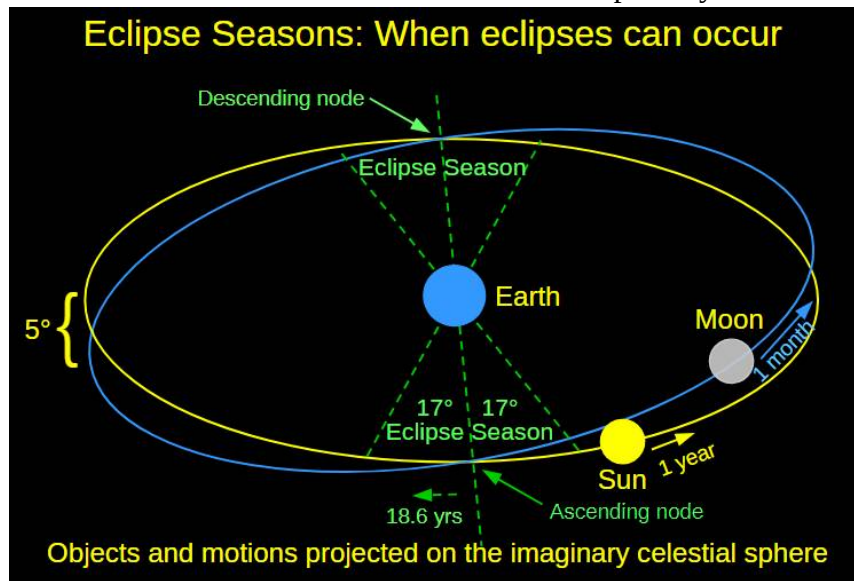


2026 – A Year of Eclipses and More

By Bob Moler

The last solar eclipse that was visible from our area was on April 8th of 2024, two years ago. Last year, we had a nice total lunar eclipse. It was visible in clear skies which is a rarity in March. This year we will see, clouds willing, 3 eclipses: two of the moon and one of the sun.

If you've been paying attention to eclipses as such, you may notice that they occurred in two periods during the year, roughly 6 months apart, called eclipse seasons.



Each year they reoccur, earlier than the prior year. Currently the seasons are around March and in August or September. Eclipse seasons occur when the sun is near where the planes of the orbits of the earth around the sun and the moon around the earth intersect. That intersection point is called a node. The moon has a slight tilt of its orbital plane compared to the earth's orbital plane of about 5°. The moon's orbit precesses slowly, so the node points move westward, or retrograde over a period of 18.6 years. This is called the regression of the nodes. And is the cause for the eclipse seasons to shift the way they do.

Anytime the sun is within about 17° of node

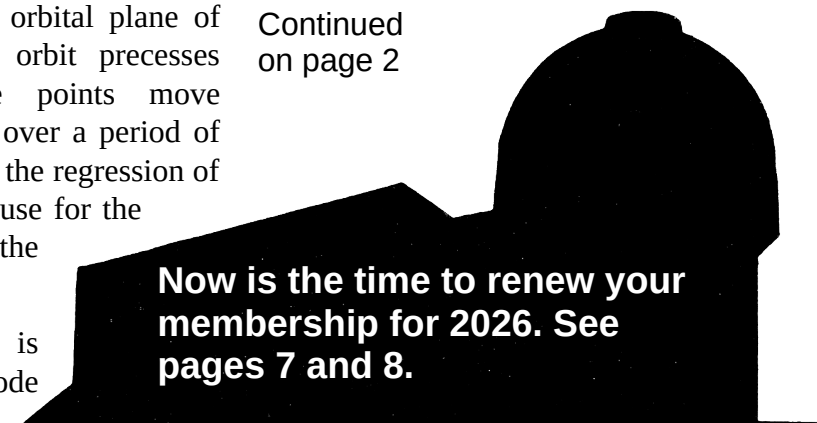
we are in an eclipse season so that any new or full moon within that period of time will experience an eclipse. Since the sun moves slightly less than 1° a day on average an eclipse season will last 34 to 35 days, a bit longer than a lunar month of 29 1/2 days, so there is a slight possibility that three eclipses may occur in a particular season, very partial eclipses near the beginning and end of the eclipse season, and a central eclipse of the opposite type. Sometimes the eclipses especially of the moon are marginal in

that the moon misses the earth's inner shadow. It's hard to detect that an eclipse is happening. I've found these penumbral lunar eclipses are best viewed with sunglasses to reduce the moon's glare.

The first eclipse is a total lunar eclipse to be viewed in the morning hours of March 3rd, before sunrise. In fact the moon will set during the ending partial phase. However the growing morning twilight might make the moon completely disappear in twilight before reappearing just before setting. We had a similar eclipse back in 2015, when the moon set

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Now is the time to renew your membership for 2026. See pages 7 and 8.



2026... (Continued from page 1).

and sun rose just before totality.

This an eclipse to get up early for rather than staying up late for. The beginning partial phase starts at 4:50 AM, totality will begin 6:04. Totality will last until 7:03 and the ending ending partial phase will end 8:17 AM. Sunrise that morning for the Grand Traverse area will be at 7:16 AM. Totality is fairly short, 58 minutes, due to its path near the southern edge of the umbra.



*What mid-eclipse should look like.
August 12, 2026 from Northern
Michigan. Created using Stellarium.*

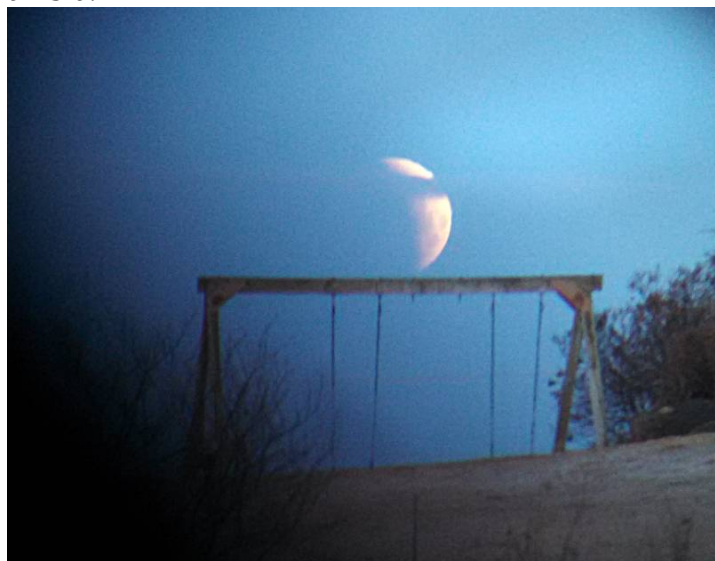
at 2:04 PM.

That's just the first event of the day. The Perseid Meteor Shower will reach its peak around 10 PM that night. That's a bit early, but the Perseid radiant is circumpolar, so the meteors will be visible all night, thanks to the new moon.

The last eclipse of the year is a lunar eclipse and the second eclipse of the August-September eclipse season. Although it's a partial eclipse it is almost total with 93% of the moon's diameter immersed in the inner umbral shadow. It starts on the evening of August 27th. Officially it's the 28th, since it completely occurs after zero hours universal time on the 28th (8 PM EDT on the 27th), it is generally denoted as the 28th of August by official sources. But it's the night of Thursday August 27th for us!

The umbral phase will begin at 10:34 PM, with mid-eclipse occurring at 12:13 AM. The umbral phase will end at 1:52 AM. The umbral eclipse will last 3 hours and 18 minutes. That's the "partial eclipse". Since the sun is a disk, the earth's shadow appears

Continued on page 3



The partially eclipsed Moon setting through a thin cloud and the neighbor kid's swing set at 7:09 AM EDT April 4, 2015. Sunrise that morning was at 7:18 AM. Taken with a smartphone through 10X50 binoculars. Credit: the author.

The next eclipse is a total solar eclipse, whose path of totality starts just north of Siberia, crosses eastern Greenland, with next landfall is in Northern Spain near sunset. We end up at the southern end of the moon's penumbral shadow, whose edge runs through Indiana and Ohio.

We will see a nibble of an eclipse, with only 11% of the sun's diameter covered at peak. The eclipse will begin at 12:51 PM for the Grand Traverse Area, mid-eclipse will be at 1:28 PM, and the eclipse will be over

Grand Traverse Astronomical Society - Est. June 1982 – 43 years of service

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Editor	Bob Moler, transitioning to Mary Gribbin		

Upcoming Society Events

Events not held at the Joseph H. Rogers Observatory depend on the weather.

Friday, January 2 – Monthly meeting and star party at NMC Rogers Observatory. Also available via **Zoom**. See our website <http://www.gtastro.org> for instructions and a link to click.

7 PM – Board of Directors Meeting

8 PM – General Meeting: Bob Moler will present his normal December program due to the cancellation of that meeting, continuing his series on ancient astronomy with ***Ptolemy—The Good, Bad and the Ugly***.

9 PM – Star Party, if it is clear.

Friday, February 6 – Monthly meeting and star party at NMC Rogers Observatory. Also available via **Zoom**. See our website <http://www.gtastro.org> for instructions and a link to click.

7 PM – Board of Directors Meeting

8 PM – General Meeting

9 PM – Star Party, if it is clear.

Zoom Meeting Link:

<https://us02web.zoom.us/j/8388913229?omn=88435646093>

2026... (Continued from page 2).

fuzzy. That fuzzy part is the penumbra where the sun is increasingly blocked by the earth. I've found that this is noticeable on the moon for about a half hour or so before and after the umbral phase. I've found the viewing the moon through sunglasses or a moon filter enhances the penumbra's dimming effect.

This would be a good time to hold a special eclipse watch at the Sleeping Bear Dunes National Lakeshore. Even though this is a Thursday night it will still be within summer vacation time for some folks. This is a bit more than a week before Labor Day. We will lose the Rangers early, if they bail out at 11:00 like they usually do. As it gets darker during the eclipse, and if we have enough telescopes, we can view some of the summer deep sky objects that the eclipsed moon will allow us to see along with the moon itself. The lunar eclipse does not require a telescope to appreciate.

That's the wrap up of a year of eclipses.



Stellarium's conception of what mid-eclipse would look like, 12:13 AM August 28, 2026

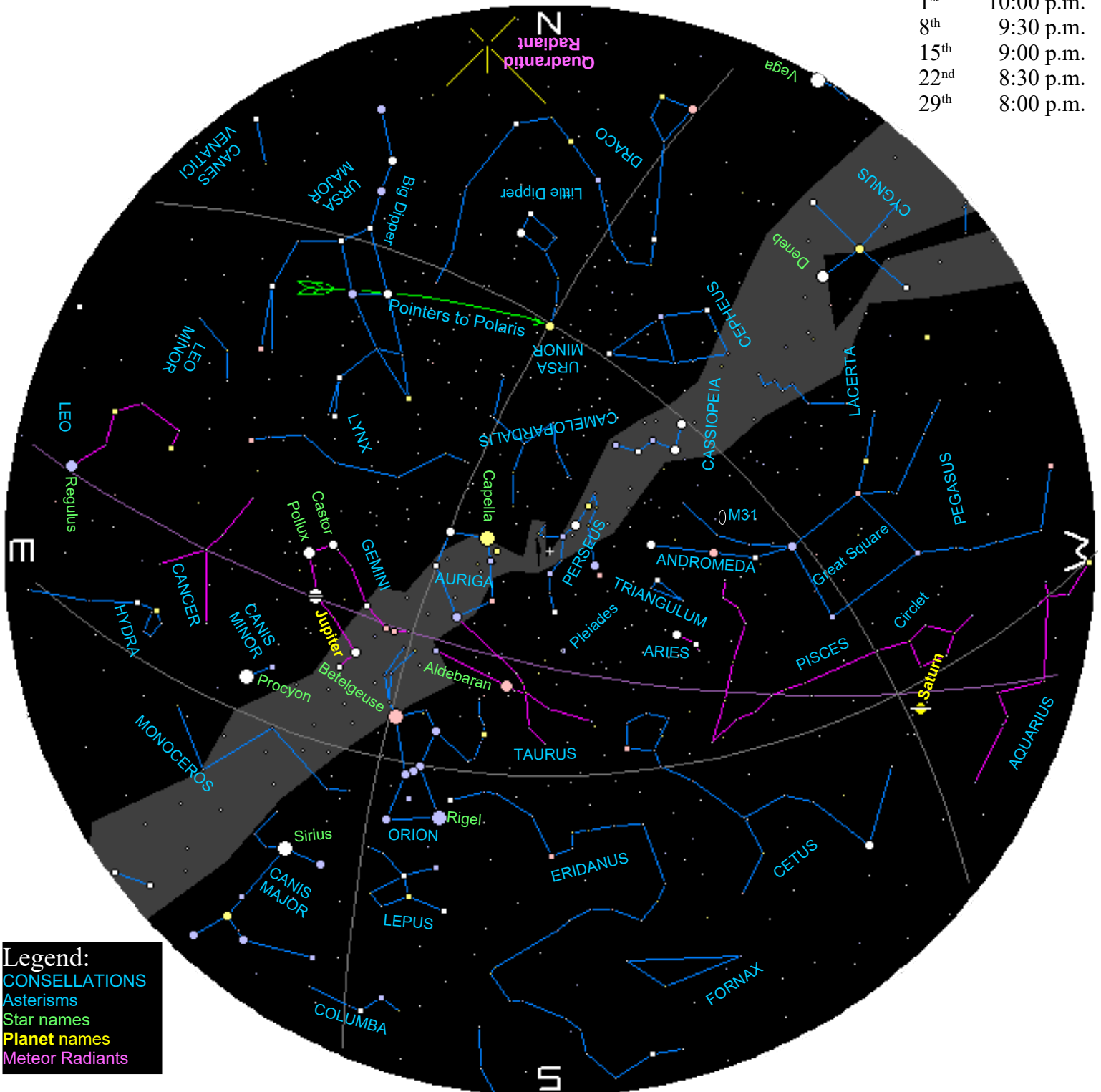
★

The Stars and Planets for January 2026

By Bob Moler

Planets are plotted for mid month. The star positions are correct for:

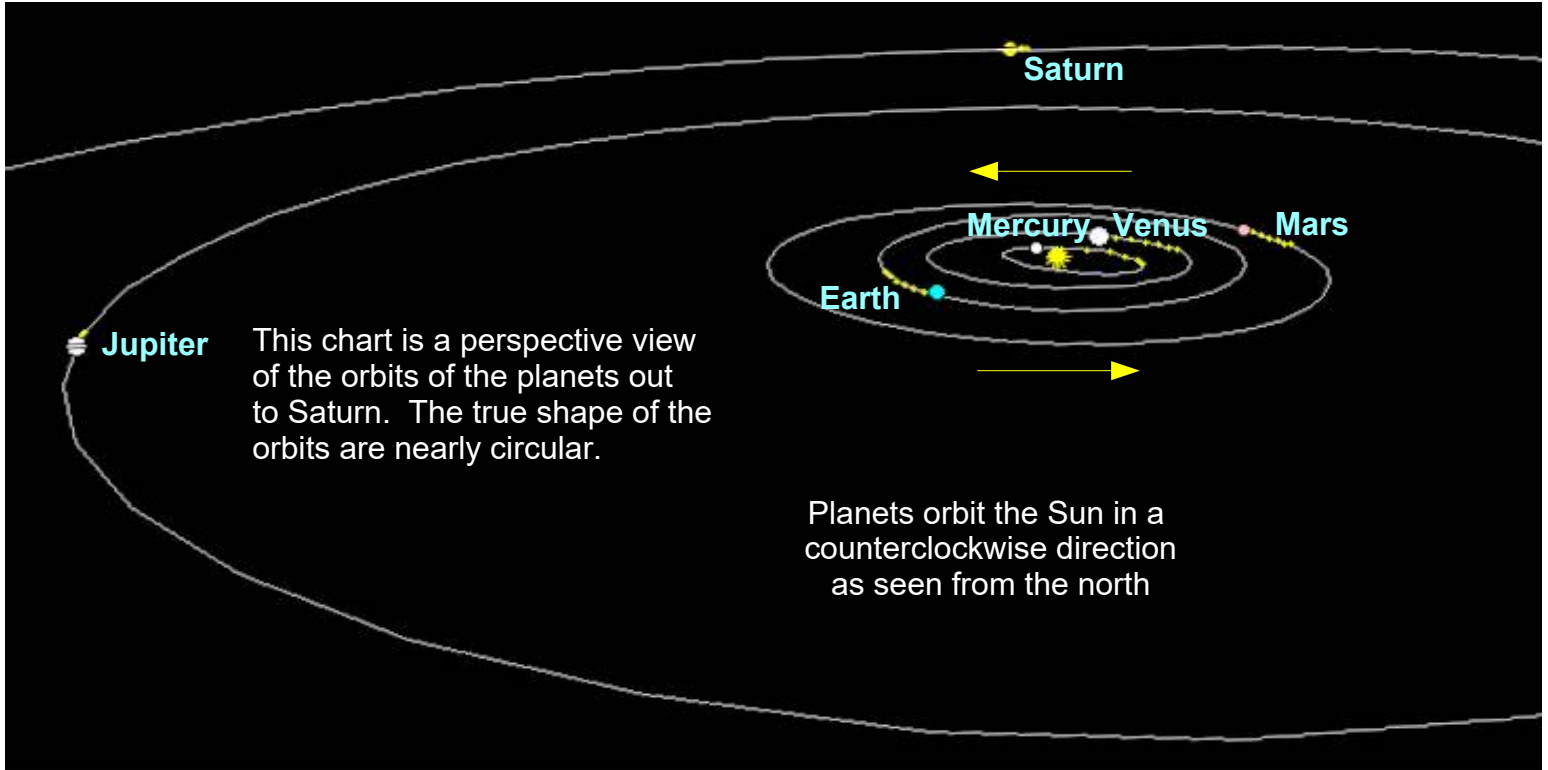
1 st	10:00 p.m.
8 th	9:30 p.m.
15 th	9:00 p.m.
22 nd	8:30 p.m.
29 th	8:00 p.m.



The central constellation of winter, Orion the hunter, is moving to take its place in the south of our evening sky now. It has two of the seven first magnitude stars of winter, part of the the brilliant Winter Circle. The autumn stars are setting toward the west. Only the tail end of Cygnus of the summer constellations survives in the northwest. The spring constellation of Leo, or at least the front part of him called the Sickle has cleared the horizon. The bright naked-eye planets Jupiter and Saturn are both up at this time.

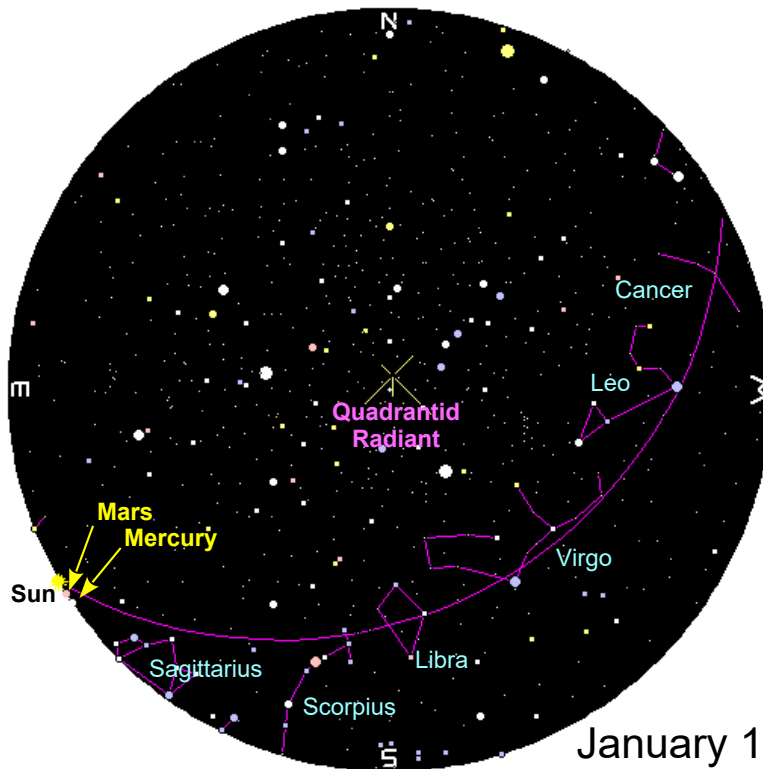
The Naked Eye Planets

January 1st, 6th, 11th, 16th, 21st, 26th, & 31st

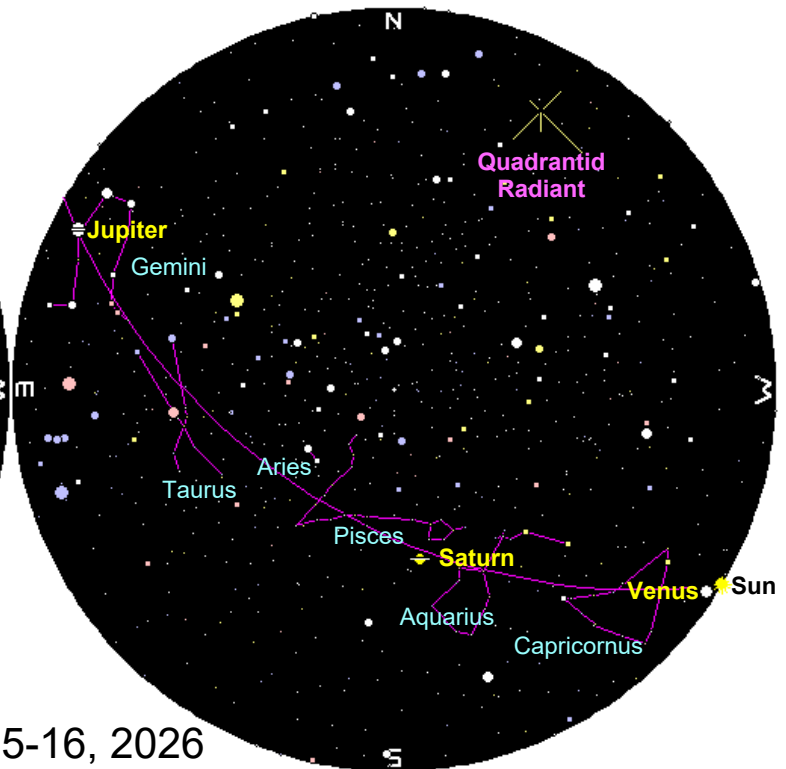


The Planets as Seen From Northern Michigan

Sunrise



Sunset



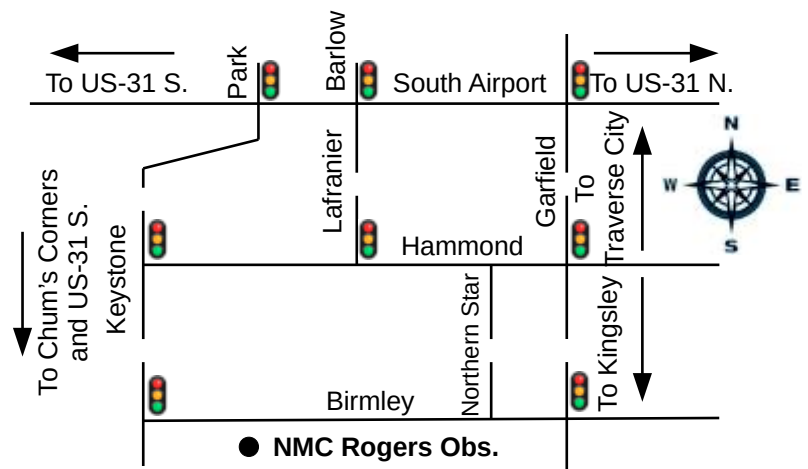
January 15-16, 2026

CELESTIAL CALENDAR

	Date	Time	Event
Jan	1	Th	Venus: 1.3° W
	1	Th	4:43 PM Moon Perigee: 360300 km
	2	Fr	3:20 AM Moon North Dec.: 28.3° N
	3	Sa	5:03 AM Full Moon
	3	Sa	11:59 AM Perihelion: 0.9833 AU
	3	Sa	4:34 PM Quadrantid Shower: ZHR = 120
	3	Sa	5:01 PM Moon-Jupiter: 3.7° S
	4	Su	8:09 PM Moon-Beehive: 1.3° S
	6	Tu	10:58 AM Venus Superior Conj.
	6	Tu	11:20 AM Moon-Regulus: 0.5° S
	7	We	6:22 AM Moon Descending Node
	9	Fr	4:58 AM Mars Conjunction
	10	Sa	3:22 AM Jupiter Opposition
	10	Sa	10:48 AM Last Quarter
	10	Sa	6:50 PM Moon-Spica: 1.8° N
	13	Tu	3:47 PM Moon Apogee: 405400 km
	14	We	2:28 PM Moon-Antares: 0.6° N
	16	Fr	12:25 AM Moon South Dec.: 28.3° S
	18	Su	2:52 PM New Moon
	21	We	10:45 AM Mercury Superior Conj.
	21	We	7:03 PM Moon Ascending Node
	23	Fr	7:31 AM Moon-Saturn: 4.5° S
	25	Su	11:47 PM First Quarter
	27	Tu	4:07 PM Moon-Pleiades: 1.1° S
	29	Th	12:02 PM Moon North Dec.: 28.4° N
	29	Th	4:53 PM Moon Perigee: 365900 km
	30	Fr	9:31 PM Moon-Jupiter: 3.9° S
Feb	1	Su	Venus: 6.3° E

Sky Events Calendar by Fred Espenak and Sumit Dutta (NASA's GSFC), <http://eclipse.gsfc.nasa.gov/SKYCAL/SKYCAL.html> to make your own for any year. Some additions and clarifications were made by the editor.

The Grand Traverse Astronomical Society meets on the 1st Friday of each month except August at the Northwestern Michigan College Rogers Observatory. The public is invited to all society functions as our guests. We are a non-profit group dedicated to the study of astronomy. If you'd like more information about us, our meeting and outreach schedule, see our website: www.gtastro.org.




Ephemeris of Sky Events for NMC Observatory

January, 2026 Local time zone: EST

DATE	SUN RISE	SUN SET	DAYLIGHT HOURS	TWILIGHT*		MOON PHASE	RISE OR SET**	TIME	ILLUM FRACTN
				END	START				
Thu 1	08:19a	05:13p	08:53	06:23p	07:09a		Set	07:59a	97%
Fri 2	08:19a	05:14p	08:54	06:24p	07:09a		Set	08:56a	100%
Sat 3	08:19a	05:15p	08:55	06:25p	07:09a	Full	Rise	05:28p	99%
Sun 4	08:19a	05:16p	08:56	06:25p	07:09a		Rise	06:50p	96%
Mon 5	08:19a	05:17p	08:57	06:26p	07:09a		Rise	08:10p	91%
Tue 6	08:19a	05:18p	08:59	06:27p	07:09a		Rise	09:25p	84%
Wed 7	08:18a	05:19p	09:00	06:28p	07:09a		Rise	10:36p	75%
Thu 8	08:18a	05:20p	09:01	06:29p	07:09a		Rise	11:44p	66%
Fri 9	08:18a	05:21p	09:03	06:30p	07:09a		Rise	12:50a	56%
Sat 10	08:18a	05:22p	09:04	06:31p	07:08a	L Qtr	Rise	01:56a	47%
Sun 11	08:17a	05:23p	09:06	06:32p	07:08a		Rise	03:02a	37%
Mon 12	08:17a	05:24p	09:07	06:33p	07:08a		Rise	04:08a	28%
Tue 13	08:16a	05:26p	09:09	06:34p	07:07a		Rise	05:12a	20%
Wed 14	08:16a	05:27p	09:11	06:35p	07:07a		Rise	06:13a	13%
Thu 15	08:15a	05:28p	09:12	06:37p	07:07a		Rise	07:08a	8%
Fri 16	08:15a	05:29p	09:14	06:38p	07:06a		Rise	07:53a	3%
Sat 17	08:14a	05:31p	09:16	06:39p	07:06a		Rise	08:30a	1%
Sun 18	08:13a	05:32p	09:18	06:40p	07:05a	New	Set	05:19p	0%
Mon 19	08:13a	05:33p	09:20	06:41p	07:05a		Set	06:30p	1%
Tue 20	08:12a	05:35p	09:22	06:42p	07:04a		Set	07:41p	5%
Wed 21	08:11a	05:36p	09:24	06:43p	07:04a		Set	08:53p	10%
Thu 22	08:11a	05:37p	09:26	06:45p	07:03a		Set	10:04p	18%
Fri 23	08:10a	05:39p	09:28	06:46p	07:02a		Set	11:16p	26%
Sat 24	08:09a	05:40p	09:31	06:47p	07:02a		Set	12:31a	37%
Sun 25	08:08a	05:41p	09:33	06:48p	07:01a	F Qtr	Set	01:48a	48%
Mon 26	08:07a	05:43p	09:35	06:50p	07:00a		Set	03:09a	59%
Tue 27	08:06a	05:44p	09:38	06:51p	06:59a		Set	04:28a	70%
Wed 28	08:05a	05:45p	09:40	06:52p	06:58a		Set	05:42a	80%
Thu 29	08:04a	05:47p	09:42	06:53p	06:58a		Set	06:43a	89%
Fri 30	08:03a	05:48p	09:45	06:54p	06:57a		Set	07:31a	95%
Sat 31	08:02a	05:50p	09:47	06:56p	06:56a		Set	08:06a	99%

* Nautical Twilight

** Moonrise or moonset, whichever occurs between sunset and sunrise

 For renewing members, all we need is your name and email or street address to identify you, plus any information that has changed.

Grand Traverse Astronomical Society – Membership Application / Renewal for 2026

I am interested, please send me more information about the next GTAS meeting. (Also see www.gtastro.org)

I'll join, payment enclosed

Email Address: _____

Membership renewal

Newsletter Delivery: **Email** **Mail** (Postcard only)

Membership term runs from January to December

Interests: _____

Name(s): _____ Home Phone: _____ Cell: _____

Address: _____

(Street, City, State ZIP)

Dues: Single Membership\$25.00/yr **Mail check to:** G.T.A.S.

Family.....\$30.00/yr Gary Carlisle, Treasurer

Student (up to 18 years age)....\$15.00/yr 1473 Birmley Road

Patron (Donation).....\$_____ Traverse City, MI 49696-8808

For new members just joining mid-year, pro rate the dues thus:
 Annual Dues X months remaining in the year / 12.
 Example: Single Joining in June:
 \$25.00 X 6 (Jul-Dec) / 12 = \$12.50

Renew your membership for 2026

2026 is the second year that we are having everyone's dues expire at the end of the year, rather than at various times during the year. Last year due to some mix ups on our part, we have lost some members. We will endeavor to gain those members back by sending this newsletter out to everyone even those who did not renew for the current year.

I, your Newsletter Editor, with Board approval, will extend the reception of the Stellar Sentinel to February for delinquent members. Only those who have paid their dues by February will receive further Stellar Sentinels, or be eligible to run for, or serve as a Board Member.

The application/renewal form is blank, so for renewals Just enter your name, email address,

or street address, dues information and any other information that changed.

I will endeavor to produce an application/renewal form that can be filled in via Acrobat Reader and other PDF reader apps. The form can be saved, printed or sent via email. I have an idea I'll discuss with the Board this January meeting to help with the dues process, and the accurate recording of the above. ★



Happy New Year!

Eileen Carlisle

Avon Representative

1473 Birmley Road

Traverse City, MI 49696-8808

Phone: 946-8123 Fax: 929-0859

E-Mail: EileenAvonRep@charter.net

WANTED: Astronomers interested in working with Project ASTRO POLARIS. Willingness to work with K-12 students and teachers. Visiting classrooms and conducting experiments, discussing astronomy interests and events. Sharing your love of astronomy with others. Will provide; training, materials, instructions and support. Please contact: Jerry Dobek Site Coordinator Project ASTRO POLARIS NMC Science & Math 1701 East Front Street Traverse City, MI 49686 email jdobek@nmc.edu phone 946-1787 obsv. 223-4545 home

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