NORTHERN LIGHTS

NORTH CENTRAL REGION OF THE ASTRONOMICAL LEAGUE

Autumn 2022 - Volume 7, Number 2

INSIDE THIS ISSUE OF *Northern Lights*

NCRAL CHAIR'S MESSAGE

I was unable to attend the ALCon 2022 meeting in Albuquerque, New Mexico, this summer. Fortunately, Region Rep. John Attewell was able to participate. See his impressions further on in this issue of ***Northern Lights***. Also, don't forget that many of ALCon's talks were broadcast live and can still be viewed by going to the League's Facebook page: https://www.facebook.com/Astronomical.League Do take a look; you'll be glad you did.

I'm happy to report that planning is continuing apace for the NCRAL 2023 Convention scheduled for May 5-6 at Grand Bear Resort located just south of North Utica, Illinois. As reported earlier, this convention will be hosted by the Twin City Amateur Astronomers of Bloomington-Normal, Illinois. The convention has a number of interesting twists that should make it both interesting and convenient to attend.

First, it has a convention theme of *Amateur Astronomy for Amateurs*. This theme will focus to a great extent on small telescope astronomy and what can be accomplished by the typical amateur with modest means. Of course, that doesn't mean that "big tech" people get left behind. There will be something in the program for them too.

Second, the convention will be held approximately 60 miles north of the Bloomington-Normal, Illinois, where NCRAL 2010 and 2016 were held. This moves the convention an hour closer to the Region's main population centers. Those living in central and northern Illinois will be able to attend with a commute of not much more than an hour. Those in eastern Iowa, southern Wisconsin, and the Chicago metropolitan area should be able to make it with as little as 1½ to 2 hours of travel. This is especially accommodating because NCRAL members can attend the convention without having to stay overnight if they'd prefer to avoid doing so.

Third, this convention will have a relaxed pace. Friday afternoon and evening activities will include an informal reception with treats and refreshments from the bar, along with plenty of time for meet and greet. There will be opportunities to set up and view in a variety of displays, including an astrophotography contest with solar system and deep sky components. There will be a flea market and "free stuff" table as well.

Fourth, we will be using a mixed format on Saturday to include lectures, panel discussions, seminars, and a workshop. We also will hold multiple parallel sessions on Saturday, so attendees can pick topics that most appeal to them.

Fifth, we will introduce three new NCRAL guides. Patterned after the TCAA Guides, these guides will deal with NCRAL leadership, convention planning, and affiliate operations – all in preparation for the upcoming transfer of leadership when I step down at the end of this meeting.

The business meeting will include nominations and election of a new chair and possibly vice chair to lead this organization through 2025. Bill Davidson, the current Vice Chair, is willing to continue on with a third two-year term. There will be the usual and ordinary officer reports as well.

We have reasonable convention rates for a resort stay, and there are many nearby things to see and do. So, if you

have never attended an NCRAL convention before, this will be a golden opportunity.

If you would like to see the PowerPoint about NCRAL 2023 presented by TCAA member Sharon MacDonald at Port Washington, you may download an updated, self-explanatory presentation here: https://bit.ly/3A9Ehht

I would be remiss if I were not to mention the fact that four NCRAL members received five national awards at last summer's ALCon event in Albuquerque, New Mexico. Make sure you read about these exemplary amateur astronomers further on in this issue of ***Northern Lights***. Congratulations to these amazing members!

Looking ahead to other matters. There are a number of tasks I have set myself before the expiration of my third and final two-year term as Regional Chair. They are as follows:

- Examining the Region's bylaws and recommending amendments in light of recent changes in the Astronomical League's bylaws.
- Revising guidelines for hosting Regional conventions in light of the challenges of COVID and recent experiences with video conferencing. (This will be called NCRAL Guide #1).
- Preparing a set of leadership guidelines for NCRAL. These will be a set of job descriptions. (This will be called NCRAL Guide #2).
- Preparing a third NCRAL Guide (#3) dealing with the formation, operation, and growth of astronomy clubs. (All three Guides will be considered works in progress and will be subject to future revision.)
- Producing a set of guidelines for a new NCRAL observing award based on the full-blown 110-object Messier Marathon.
- Continue producing the ***Northern Lights*** newsletter, which is a joy for me and not a job associated with the position of NCRAL Chair which a number of members have mistakenly concluded.
- Finding nominees for the Region's new Chair and Vice Chair positions starting next May 6 with NCRAL 2023.
- Finding affiliates to host future NCRAL conventions in the years 2024 and beyond.

With regard to the final two points, it is essential that the Region find a replacement for the current chair and a host for the 2024 convention. As is, I must step down following my third term as Regional Chair as required by the Region's bylaws. Please help identify both candidates and future convention hosts. Ask prospective individuals you know; consult with your fellow members. If no candidate can be found (and I've asked several prospects over the past two years without success), we could leave NCRAL 2023 without a Chair and without a prospect of a future convention. This has happened to other regions in recent years; don't let it happen to NCRAL. I have done my best over the past six years; it's now someone else's time to step up and take the lead.

In closing, I want to thank everyone who has contributed to make this issue of ***Northern Lights*** possible. Their efforts on behalf of the Regional membership are greatly appreciated.

Carl J. Wenning
NCRAL Chair (2017-2023)

NORTH CENTRAL REGION OF THE ASTRONOMICAL LEAGUE FINANCIAL STATEMENT
01 July 2022 - 30 September 2022

			Check	Daily	Monthly	
	1-Jul-22				$8,112.83	July
	31-Jul-22				$8,112.83	July
1026	1-Aug-22	USPS (mail certificate & pin)	$6.39	$8,106.44		August
	31-Aug-22				$8,106.44	August
	1-Sep-22				$8,106.44	September
	30-Sep-22				$8,106.44	September
				Net Change	$6.39	

NATIONAL COUNCIL MEETING IMPRESSIONS

BY JOHN ATTEWELL, NCRAL REP.

A full-day Astronomical League Council meeting held on July 27th was concerned with reviewing, updating the League by-laws, and standing resolutions. By-laws are a set of rules that are pre-established by an organization to regulate itself. Standing resolutions are continuous rules that deal only with administrative matters and function. Standing resolutions remain in-force until such time as amended or revoked by the Executive Committee. By-laws are voted on by a quorum of the membership.

I discovered that if a club – any club – has enough assets (cash, property, equipment, etc.) most states have requirements that a club has binding by-laws. Even if they are a non-profit organization or just a charitable organization that is tax exempt; a detailed governance is required by the incorporating state. There is a lot of leeway with how the by-laws can be written, but certain guidelines must be followed.

The Astronomical League is registered in the state of Missouri, so Missouri state law regulates what is in the league's by-laws. The league is financially healthy, so we have had by-laws for many decades. However, we are expecting a large endowment from a deceased member, so we thought this would be an excellent time to review the by-laws, bring them up to date with state law, and resolve any ambiguities.

The League's by-laws are very detailed and cover the following general subjects:

- Membership (criteria, classes, privileges, etc.).
- National officers (duties, terms, executive committee, resignations or removal, succession, etc.)
- Council (function, membership, quorum, voting, etc.)
- Elections (nominations, voting, misconduct)
- Dues
- National conventions
- Standing and ad hoc committees
- Meetings (procedural rules and meeting types)
- Regions and Regional Activities
- Property and Financial
- The Trust Fund
- Miscellaneous articles for amendments and ratifications

The standing resolutions cover many topics:

- Trust fund procedures (establishment, use, trustees)
- National convention agreements
- Guidelines for regional assistance
- Financial management (audits, investments, budget, services, etc.)
- Long-range planning
- Dues (member classifications and fees)
- Commercial exhibitors
- Awards (purpose, nominations, presentations, selection, etc.)

We're very lucky to have a Council that has many years of experience handling some pretty unusual experiences that have led to these comprehensive by-laws. We also have been aided greatly by one Executive Committee member who is a retired attorney who practiced contract law in the state of Missouri.

John Attewell
NCRAL Rep.

FUTURE NCRAL CONVENTIONS

During NCRAL's annual business meeting, the Region receives offers for hosting upcoming conventions. We are now looking for hosts for NCRAL 2024 beyond. It's never too early to start planning to host an NCRAL convention. The following affiliate has agreed to host the next convention; hosts are needed for 2024 and beyond.

- 2023, North Utica, Illinois, Grand Bear Resort at Starved Rock, Twin City Amateur Astronomers (May 5-6)
- 2024, 2025, and beyond: **HOSTS NEEDED**

Whether or not your club has ever hosted an NCRAL Regional convention, please consider doing so in 2024 or later. While hosting a Regional convention is a considerable amount of work, it can be quite rewarding – even fun. It provides an opportunity to highlight your group's facilities and accomplishments, build club camaraderie, and to get to personally know interesting guest speakers. You can also use such an event to grow your club's membership.

Remember, NCRAL now has its own convention planning guide. To download the planning guide, visit the following URL: https://ncral.wordpress.com/conventions/. Look for the link at the bottom of the page.

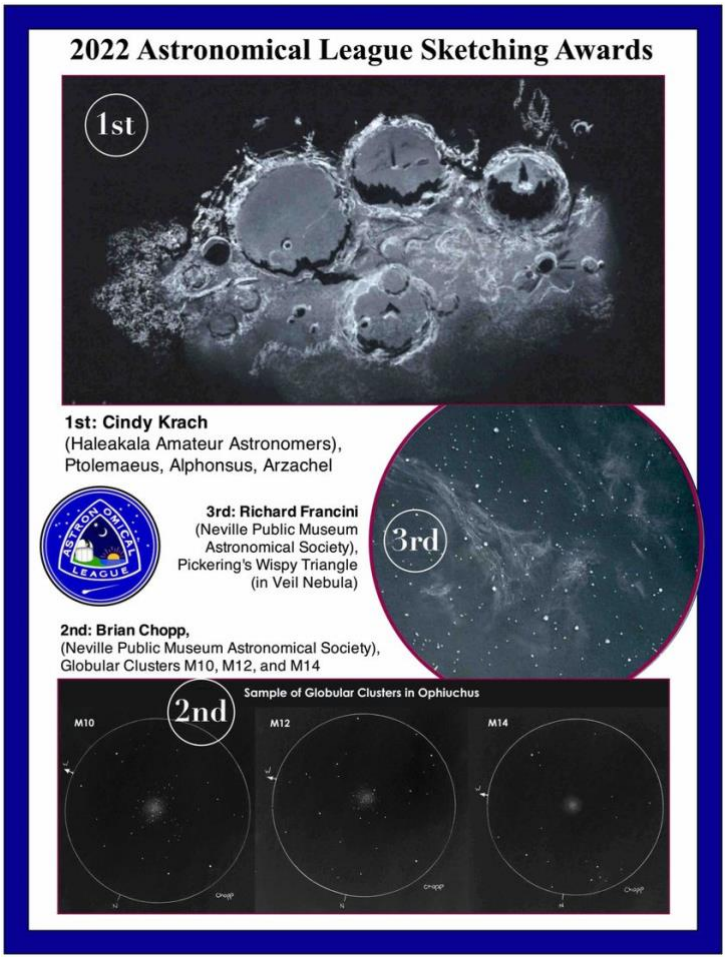
Please contact NCRAL's Chair at carlwenning@gmail.com should you have any questions or wish to toss your affiliate's hat into the ring for hosting a future NCRAL convention.

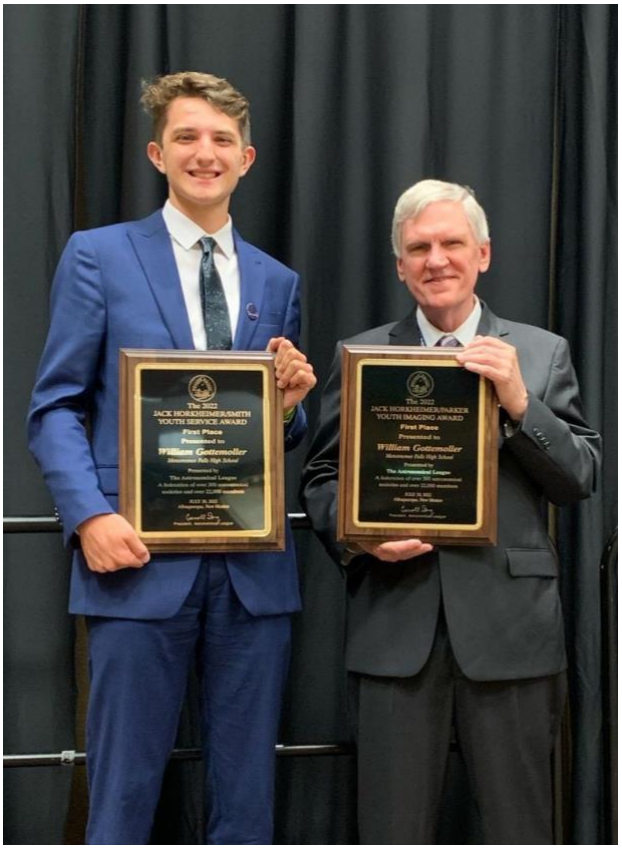
NOTEWORTHY!

The Region is exceptionally proud to note that we have more national award winners. The Astronomical League awarded four NCRAL members with five awards at its ALCon 2022 convention.

William Gottemoller of the Milwaukee Astronomical Society received two recognitions - the **2022 Jack Horkheimer/Smith Youth Service Award** and the **2022 Jack Horkheimer/Parker Youth Imaging Award**. A lengthy article appeared in the September 2022 issue of ***Reflector*** documenting Mr. Gottemoller's amazing accomplishments. Congratulations William!

Congratulations also go out to the 2022 Astronomical League **Sketching Award** winners, two of whom hale from within NCRAL.





William Gottemoller with his two youth awards.

The 2nd place winner was Brian Chopp (Neville Public Museum Astronomical Society) for his depiction of three Messier globular clusters in Ophiuchus - M10, M12, and M14. The 3rd place winner was Richard Francini (Neville Public Museum Astronomical Society) for his detail of the faint wispy central section of the Veil Nebula known as Pichering's Triangle.

To complete the group of 2022 Astronomical League Awardees, Sandullah Epsicokhan of the Twin City Amateur Astronomers received this year's **Mabel Sterns Newsletter Editor Award** for producing ***The OBSERVER*** *of the Twin City Amateur Astronomers.*

Also worthy of note are two NCRAL-affiliated members who had articles published in the September 22 issue of ***Reflector***. Jamey Jenkins (Twin City Amateur Astronomers) wrote *Keep an Eye on This One* and Dave Tosteson (Minnesota Astronomical Society) penned *The New Andromeda.*

The following NCRAL members were recognized for having completed Astronomical League observing programs in the latest issue of ***Reflector***. Congratulations to all for their many and varied successes!

Binocular Variable Star Observing Program:
Dave Tosteson, Minnesota Astronomical Society

Lunar Evolution Program:
John T. Varn, Cedar Amateur Astronomers

Nova Observing Program:
Dick Francini, Gold, Neville Public Museum Astronomical Society

Sketching Observing Program:
Dave Tosteson, Minnesota Astronomical Society

Universe Sampler Observing Program:
Stephen Pavela, La Crosse Area Astronomical Society

Master Observer Progression

Observer Award:
Stephen Pavela, La Crosse Area Astronomical Society

Master Observer – Silver Award:
Dave Tosteson, Minnesota Astronomical Society

Master Observer – Gold Award:
Dave Tosteson, Minnesota Astronomical Society

Binocular Master Observer Award:
Dave Tosteson, Minnesota Astronomical Society

NCRAL Seasonal Messier Mini Marathon Awards – Summer 2022

- Dave Osenga, Twin City Amateur Astronomers, certificate #18, assisted, Summer Mini Messier Marathon Award.

Autumn Skies, 2022

By Jeffrey L. Hunt

The **sun** reaches the coordinates of the autumnal equinox on September 22nd at 8:04 pm CDT. The season has no day with the magical 12 hours of daylight. September 26th has a minute less than that mark. Daylight slips away until the winter solstice, December 21 at 4:48 PM CST. The season is 89 days, 20 hours, 40 minutes in length. Autumn's mid-point occurs on November 6th at 8:24 AM CST.

As the sun rises and sets farther southward, daylight shrinks, and nighttime lengthens. Night can be split into twilight, both before sunrise and after sunset, and darkness, the interval when the sun is below the horizon more than 18°, the altitude for Astronomical Twilight, to either end or begin. Together daylight, twilight, and darkness are 24 hours long. On Halloween, darkness, 10 hours, 28 minutes, is longer than daylight. This continues for 103 days at Chicago's latitude, until February 11, 2023, when daylight's length is again longer than darkness.

Interestingly, this interval varies greatly by latitude. For Miami, darkness is longer than daytime for 40 days; Tucson, 80 days; Seattle, 112 days; and Juneau, 120 days. It appears that the House of Representatives will not take up the Sunshine Protection Act that set year-round daylight time across the United States. Senator Marco Rubio's (R-FL) hometown (Miami) clearly does not need daylight time. It has ample daylight throughout the year. Co-sponsor Senator Patty Murray's (D-WA) Seattle has no daylight to save and long twilight during the summer.

Back in the sky, Spica is at its solar conjunction on October 17th. This is the date when Arcturus makes its first morning appearance in the east-northeast before daybreak. The brightest star north of the celestial equator is still appearing in the west after sunset. This effect occurs for other bright stars such as Vega, first morning appearance November 19th while still in the evening sky. Deneb's first morning appearance is about December 3rd. Farther north, of course, the circumpolar stars never set.

During autumn mornings, the Big Dipper stands on its handle in the northeast. Note its place each clear morning, indicating Arcturus' location, whether above or below the horizon. Spica's first morning appearance is near Halloween.

Antares is at its solar conjunction on December 1st, making its first morning appearance near the time of the winter solstice. About Thanksgiving begin looking for the Scorpion's classic pincers, Zubenelgenubi (α Lib, m = 2.8) and Zubeneschamali (β Lib, m = 2.6), low in the east-southeast. Watch Scorpius climb into the morning sky during the next

several weeks. The same occurs in the spring when the same pattern makes its first appearance in the evening sky after sunset.

This westward migration of the constellations is similarly shown with Hydra. Its head is between Procyon and Regulus. The stars span over four hours of right ascension below Leo, Virgo, Crater, and Corvus, ending about 10° southwest of Zubenelgenubi.

On October 25th, a partial solar eclipse is visible from most of Europe and the Middle East, Central Asia, and northeastern Africa. The maximum obscuration – fraction of the sun's diameter covered – is 0.86. The moon's shadow first touches Earth's surface at 3:58 AM CDT and leaves at 8:02 AM CDT.

Considering solar eclipses, an annular eclipse occurs October 14, 2023. Annularity is visible from Oregon to Texas. From the NCRAL region, about 40% of the sun is covered. Be sure to make your travel arrangements for this eclipse.

Moon Phases (CDT)

Phase	Sept.	Oct.	Nov.	Dec.
New	09/25	10/25	11/23	12/23
First	09/03	10/02	11/01, 11/30	12/29
Full	09/10	10/09	11/08	12/07
Last	09/17	10/17	11/16	12/16

On October 18th, spot the morning crescent **moon**, 44% illuminated, with the Beehive star cluster (Messier 44, NGC 2632). The separation is 5.4°. On November 15th, the gibbous moon, 60% illuminated is back in the area. The moon returns again, 84% illuminated, on December 12th. The October date promises the easiest view of the season with a less-illuminated moon.

On November 8th, a total lunar eclipse in Aries reaches its maximum at 4:59 AM CST. At this hour, the moon is only 17° up in the west from Chicago. The total phase lasts from 4:16 AM to 5:42 AM, ending with the moon only 9° up in the west-northwest.

At the beginning of totality, the eclipsed moon is 12.1° to the upper left of Hamal (α Ari, m = 2.0), 16.0° below the Pleiades, and 2.1° to the lower right of Uranus.

The moon sets before the eclipse finishes. Observers in western North America see the entire eclipse process. At maximum eclipse, the moon is at the zenith in the Pacific Ocean, west of Hawaii.

The darkness of a solar eclipse is difficult to predict, but it is affected by a number of atmospheric factors. The Danjon scale rates the darkness of an eclipse, using numbers from zero to four. The May 2022 eclipse was rated as L=2, "Deep red or rust colored eclipse."

On December 7th, the full moon occults Mars (on its opposition night) from a large region across North America, Greenland, and western Europe. In Chicago, the occultation begins at 9:11 PM CST. Mars reappears about an hour later. See this link for predictions for other locations.

Mercury makes its third and best morning apparition of the year during early October. It passes inferior conjunction on September 23rd at 1:50 AM CDT. It speeds into the morning sky and reaches its morning greatest elongation (18.0°, m = −0.6) on October 8. While the elongation is relatively small, the ecliptic is favorably inclined for the planet to rise 92 minutes before sunup from October 8 through 11. On the 8th, the speedy planet passes 0.8° to the upper left of Beta Virginis (β Vir, m = 3.6). At 45 minutes before sunrise, find the pair over 8° up in the east.

The planet races back into bright sunlight passing its superior conjunction on November 8th at 10:43 AM CST. It moves into the evening sky, joining Venus, Saturn, Jupiter, and Mars, as well as dimmer Uranus and Neptune. Reaching its evening greatest elongation (20.1°, m = −0.6) on December 21st, it sets 87 minutes after the sun. This longest setting interval continues through the 25th.

On December 24th, Mercury, Venus, and the crescent moon fit within a 7° circle. On the 28th, Mercury passes 1.5° to the upper right of Venus. At forty-five minutes after sunset, use a binocular to spot this pair about 4° up in the southwest.

As the equinox occurs, **Venus** is in transition from the eastern morning sky to a western evening appearance. On equinox morning, the Morning Star rises only 42 minutes before sunrise, before Civil Twilight. About 25 minutes before sunrise, it is less than 5° above the eastern horizon. The visibility worsens through its superior conjunction on October 22nd. Then the planet begins a slow entry in the western evening sky.

For enthusiastic sky watchers, on November 24th, the crescent moon (1% illuminated), Mercury, and Venus appear in the same binocular field of view during the daytime. Venus' elongation is only 8° east of the sun. The usual warnings for looking for objects near the sun with optical instruments is in play here. Be careful.

By November 28th, Venus sets at Civil Twilight and Nautical Twilight on December 12th. With a binocular and a clear horizon, the planet becomes visible low in the west-southwest at 30 minutes after sunset. By the winter solstice, Venus sets an hour after sundown.

Mars is the spectacle of the season. On the equinox, the planet rises before 10:30 PM CDT in Chicago, nearly 3.5 hours after sunset. During morning twilight, it is high in the south, near the star Iota Tauri (ι Tau, m = 4.6), about midway from the Bull's head, outlined by Aldebaran (α Tau, m = 0.8) and

the Hyades star cluster, and the horns, dotted by Elnath (β Tau, m = 1.6) and Zeta Tauri (ζ Tau, m = 3.0).

Mars marches eastward and its course is easy to track from night to night. It enters the same binocular field with Zeta and the Crab Nebula (Messier 1, NGC 1952) about September 25th. Notice on this morning the planet makes nearly an equilateral triangle with the horns. While Mars passes somewhat nearby to the supernova remnant, they do not appear in the same telescopic eyepiece.

On October 7th, Mars (m = −0.7) passes Elnath for the first of three conjunctions. On the 13th, Mars, M1, and Zeta are in a line, spanning 2.4°. This is not necessarily a good night to look for the nebula with the moon about 20° away and near the Pleiades. On the 15th, the gibbous moon joins the scene, 4.7° to the upper left of the planet. Two nights later Mars passes between the horns, 5.7° to the lower left of Elnath and 2.2° to the upper right of Zeta. The two stars are too far away to capture the triplet in a single binocular field of view. On the 22nd, Mars has its first conjunction with Zeta.

During September, Mars moves eastward 0.45° each night while during October the rate averages 0.18°. From mid-September through mid-October the rate is 0.35° each day. Mars' speed obviously slows when it nears Elnath and Zeta.

On October 30, Mars begins to retrograde 2.7° northeast of Zeta. The planet seems to reverse course, passing Zeta on November 7th for the second of three conjunctions. On the 11th a bright gibbous moon is 7.1° to the right of Mars. Two nights later the planet passes between the horns again, 4.5° from Elnath and 3.4° from Zeta. As the planet begins to pick up speed, it passes 4.0° from Elnath.

Earth and Mars are closest on November 30th, 0.544 AU. This closest approach occurs before opposition because Mars is still moving away from Earth on that night. During November, its brightness increases over a half magnitude to −1.8.

Through a telescope, Mars is 17.2 arcseconds in diameter. Winter is in progress in the Martian northern hemisphere through December 26th. The northern hemisphere is mostly tilted away from view. For more details on what to see, check the Mars blog on the ALPO website. *Sky & Telescope's* Mars profiler tool shows what's visible on the surface at any particular time.

On December 7th, Mars passes through opposition, appearing in the sky nearly all night. The moon occults the Red Planet – an opposition-occultation. See the Moon section for more details and link for occultation predictions.

After opposition, Mars appears in the east-northeast after sundown, joining Jupiter and Saturn, that are farther westward. It joins the other bright planets' appearances near month's end, passing 8.2° from Aldebaran for the second conjunction on December 25th.

After sunset on December 31st, nearly two-thirds of the way up in the east- southeast, Mars passes 5.4° to the upper left of ε Tau, the star in the "V" of Taurus opposite Aldebaran. Notice υ Tau and κ Tau between them. Mars is passing these stars for their second conjunctions as well.

Bright **Jupiter**, dominates the evening sky, passing opposition on September 26th. Robert C. Victor, retired staff astronomer of Abrams Planetarium at Michigan State University, notes that this is the closest opposition since 1951. The next time Jupiter's opposition is closer is October 2129! This time at opposition it is nearly 50 arcseconds across and shines at magnitude −2.9. The planet is nearly on the celestial equator, 1° south of the ecliptic, and about 4° east of the vernal equinox coordinates.

The planet is retrograding in a starfield of 5th and 6th magnitude stars in Pisces. Unlike the sidereal mile markers in Taurus to spot Mars' trek, Jupiter appears alone in its seemingly backwards motion.

The moon is near Jupiter on October 8th, November 4th, and December 1st.

Local time, the planet transits (appears in the south) at nearly 11:30 PM CDT on October 15th; November 15th, 8 PM CST, and December 15th, 6:15 PM CST.

Here are some predictions when the Great Red Spot is visible in the center of Jupiter in the southern hemisphere and the planet is approximately 45° up in the sky: **Sept 30**, 11:03 PM CDT; **Oct 3**, 12:41 AM; **Oct 10**, 1:26 AM; **Oct 15**; 12:34 AM; **Oct 22**, 1:20 AM; **Oct 27**, 12:27 AM; **Nov 3**, 1:04 AM; **Nov 5**, 10:30 PM; **Nov 7**, 11:07 PM CST; **Nov 10**, 8:38 PM; **Nov 12**, 10:15 PM; **Nov 15**, 7:50 PM; **Nov 20**, 7:00 PM; **Nov 25**, 6:05 PM; **Dec 2**; 6:45 PM; **Dec 7**, 6:00 PM; **Dec 9**, 7:35 PM; **Dec 14**, 6:45 PM; and **Dec** 19, 5:56 PM

The four largest satellites (Galilean satellites) – Io, Europa, Ganymede, and Callisto – pivot back and forth from the east side to the west side. Callisto can be seen with a binocular when it is near its greatest separation from Jupiter.

On the evening of November 2nd, beginning in evening twilight, Europa's shadow can be seen on the cloud tops near the center of the planet. Ganymede's shadow falls on the clouds at about 6:30 PM CDT and a double shadow event lasts for about 30 minutes. Europa's shadow leaves the planet, leaving Ganymede's shadow as the single sighting until about 9:05 PM Single shadow events of both moons occur on the night of November 9/10. The moons' shadows can be seen on the cloud tops from the four moons. For example, on the night of September 30/October 1, when the Red Spot crosses into view, Io's shadow is projected on the cloud tops beginning about 10:50 PM CDT. It seems to track the Red Spot across the planet. The shadow leaves over two hours later, shortly after Jupiter spins the spot out of view.

Saturn begins the season in the southeast as night falls. It is retrograding in eastern Capricornus, west of Delta Capricorni (δ Cap, m = 2.8) and Gamma Capricorni (γ Cap, m = 3.6). Watch the planet open noticeable gaps with them. The planet returns to direct motion on October 23rd, about 0.5° east of Iota Capricorni (ι Cap, m = 4.2).

Saturn leads the other two bright outer planets – Jupiter and Mars – eastward during the night along with Neptune and Uranus. The bright trio is migrating westward with the seasonal changes of the constellations. Find them strung along the ecliptic during the overnight hours. Use Jupiter's transit times noted above as the approximate time to look for them.

Through a telescope, the Ringed Wonder displays a disk about 18 arcseconds across. The rings are inclined about 15°.

Watch the motions of its five brightest satellites. Titan is the brightest (m = 8.4) and has the greatest separations with the planet. It revolves around the planet in nearly 16 days.

Another moon, Iapetus, revolves around the planet much slower (about 80 days) than the other closer-in five moons and farther away from the planet. It reaches inferior conjunction on October 3rd, but the planet is below the horizon at the conjunction time. The moon can be seen near the planet's globe on the nights of the 3rd and 4th. It reaches is maximum western elongation on October 24th. It returns for its superior conjunction on November 14th.

The moon is near Saturn on October 5th, November 1st and 28th, and December 26th.

Uranus (m = 5.6), between Jupiter and Mars, is retrograding in Aries, in the same binocular field of view as Rho Arietis (ρ Ari, m = 5.6), Pi Arietis (π Ari, m = 5.2), and Sigma Arietis (σ Ari, m = 5.5). The moon passes close by and occults the planet from various geographic locations during the season. On October 11th, the moon is only 2.2° from the planet when they rise. After midnight on the 12th the lunar orb is only 0.3° away from the planet. The planet is occulted from most of northern North America, including Canada and Alaska, as well as Greenland. On the night of November 7/8, the moon starts the evening about 6° east of Uranus. The eclipsed moon closes to about 1.7° during the lunar eclipse about 90 minutes before moonset. Uranus makes an equilateral triangle with π Ari and ρ Ari, 1.8° on a side on the 20th. On December 5th, the moon starts the evening 4.0° to the east of the planet.

Neptune (m = 7.8) is in northeastern Aquarius, near the Pisces border and about 10° west of Jupiter. It reached opposition on September 16th. It retrogrades until December 4. The bright moon passes by on the evenings of October 7th (4.1°), November 3 (6.5°), December 1 (5.8°), and December 28 (3.4°). On the evening of November 3rd, Jupiter, Neptune, and the moon fit in the same binocular field of view. Catch the scene early during the evening as the moon's motion makes the fit tighter as the night progresses. Jupiter and Neptune are in the same binocular field from late October through early December.

The bright planets form an **Evening Planet Parade** during evening twilight from December 24 – 28, spanning over 140°. Starting from the sunset point and looking eastward, the order is Venus, Mercury, Saturn, Jupiter, and Mars. Add in Uranus and Neptune to make this a full solar system line up.

ADD YOUR EMAIL ADDRESS TO THE NCRAL MEMBER DATABASE

Did you know that only about 475 of our Region's 1,900 members are receiving this newsletter via email? That's less than one-fourth of the membership. Please help NCRAL get its newsletter out to the membership by encouraging fellow club members to add their email addresses to the NCRAL member database. Editors, please include this information in your affiliate's newsletter.

When one adds his or her email address to the NCRAL member database, he or she will receive direct notifications about the availability of ***Northern Lights***. In addition, subscribers will receive important and timely announcements about Regional conventions, elections, star parties, and so forth. Only blind addressing (Bcc:) will be used with this email list so that others will not see subscribers' email addresses. Email addresses will never be shared with or sold to outside entities.

No one will add your email address to this list for you, so you'll need to do it yourself. Sign-up takes only about a minute. You'll need to provide your name, email address, astronomy club affiliation (or indicate A.L. membership-at-large) and let us know if you hold specific positions within your club. Go to the following case-sensitive URL to add your information to our database at https://goo.gl/gsS8SF today, so you won't miss important future communications.

NCRAL Seasonal Mini Messier Marathon Observing Program

The NCRAL Seasonal Mini Messier Marathon program is intended to serve as motivation to get NCRAL-affiliated members out under the stars to observe. The program permits the use of goto telescopes to find objects and, as such, the program must not be considered proof of observing prowess. The Astronomical League's Messier observing program serves that purpose. Still, NCRAL observing certificates include the words "assisted" or "unassisted." Certificates and pins are now being distributed on the equinoxes and solstices along with ***Northern Lights*** by the program administrator. NCRAL Secretary-Treasurer Roy Gustafson is program administrator. Please send observing records to Roy at astroroy46@gmail.com. Up-to-date details about the Region's four observing program and helpful observing record sheets can be found on the NCRAL website: https://ncral.wordpress.com/awards/.

Autumn: M55, M69, M70, M75, M11, M26, M56, M57, M71, M27, M29, M39, M2, M72, M73, M15, M30, M52, M103, M31, M32, M110, M33, M74, M77, M34, and M76. (27 objects)

Winter: M1, M45, M36, M37, M38, M42, M43, M78, M79, M35, M41, M50, M46, M47, M93, M48, M44, M67, M40, M81, M82, M97, M101, M108, M109, M65, M66. (27 objects)

Spring: M95, M96, M105, M53, M64, M85, M88, M91, M98, M99, M100, M49, M58, M59, M60, M61, M84, M86, M87, M89, M90, M104, M3, M51, M63, M94, M106, and M68 (28 objects)

Summer: M83, M102, M5, M13, M92, M9, M10, M12, M14, M19, M62, M107, M4, M6, M7, M80, M16, M8, M17, M18, M20, M21, M22, M23, M24, M25, M28, and M54. (28 objects)

OBSERVING NOTES:

- ***Autumn:*** This season's objects span a wide range of right ascension and declination. With several objects located in Sagittarius and disappearing into the glare of the sun by mid-autumn (M55, M69, and M70), it is best to complete the autumn observing program before the end of October. After that they will be too near the sun to observe during late autumn evenings.
- ***Winter:*** It probably would be best to begin the winter Marathon around mid-February or later. Any earlier in the year, observers will have to wait until late into the night for all winter objects to have risen high enough in the sky to observe. With winter weather moderating in March, it wouldn't be too late to start then so long as observations are completed by the March equinox.
- ***Spring:*** This season's objects span a rather narrow region of right ascension, with most of the objects being associated with or in proximity to the Virgo-Coma cluster of galaxies. At the start of spring, an observing run beginning near the end of astronomical twilight should allow observers to view all objects by around 10:30 PM. By mid-April, all objects should be well enough placed at the end of astronomical twilight allowing for their fastest possible observation.
- ***Summer:*** All summer Marathon objects are above the horizon at the end of astronomical twilight on the first day of summer through the last day of summer. They are nearly all tightly clustered around the galactic center, and most are globular clusters with a few notable exceptions.
- UPDATE (June 4, 2021): *By fiat of the Regional Chair, it is permissible for a group of two or more individuals to work together using a single telescope on the same night to earn a seasonal Mini-Messier Marathon certificate and pin, so long as the group shares a single certificate and pin. All members of a group must observe each Messier object.*

REGIONAL OFFICER & LEADER CONTACT INFORMATION

Chair and **Newsletter Editor:** **Carl Wenning**

Bio: Carl has been an avid amateur astronomer since being introduced to the sky by his grandfather during July 1957. Today he is an ***A.L. Master Observer*** spending most of his time introducing nascent amateur astronomers to observing. He has been involved with the *Twin City Amateur Astronomers* (Illinois) since September 1978. Carl served as editor of his club's newsletter, ***The OBSERVER,*** from 2014-2021, during which time he received the Astronomical League's *Mabel Sterns Newsletter Editor Award* in 2017. He has served as the Region's newsletter editor from 2016 to present. He was recognized for his Regional education and outreach efforts in 2007 when he received the ***NCRAL Region Award***. Carl served as planetarium director and physics teacher educator at Illinois State University (1978-2008). (Two-year term as Regional Chair, currently in third and final term, 2017-2023; ***Northern Lights*** Newsletter Editor, 2016-present.)

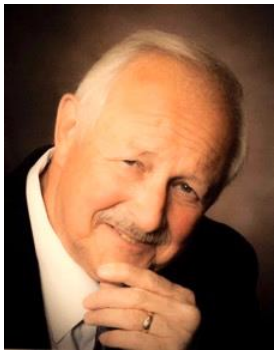
Contact: carlwenning@gmail.com

Vice Chair: **Bill Davidson**

Bio: In the days of the Apollo missions, Bill first observed the moon (and sunspots!) with a 50x, 60mm JC Penny's refractor telescope. Not discouraged, 40 years later, he built and observes with a 6.25-inch achromatic doublet objective, f/10, 1600 mm focal length refracting telescope. He recently retired as a college mathematics instructor, has been a member of the *Rochester Astronomy Club* (Minnesota) for more than 20 years, and serves as editor of the club's award-winning newsletter ***Rochester Skies***. (Two-year term as Vice Chair; currently in second term, 2021-2023.)

Contact: rochesterskies@outlook.com

Secretary-Treasurer: **Roy Gustafson**



Bio: Roy, a member of *Popular Astronomy Club* (Quad Cities), got interested in astronomy when visiting the Adler Planetarium in Chicago when he was in 2nd Grade. The stars projected by the Zeiss Projector hooked him and started him on the path of astronomy. He has been active in outreach and has presented astronomy programs to over 20,000 people. He was awarded the ***Master Outreach Award*** from the Astronomical League. Roy travels with his telescopes and has observed both Transits of Venus and total solar eclipses in 2017 and 2019. Roy also taught astronomy at Black Hawk Junior College in Moline, IL. Roy retired from John Deere & Company after 32 years of service. (Two-year term as Secretary-Treasurer; currently in third term, 2018-2024.)

Contact: astroroy46@gmail.com

Regional Representative: **John Attewell**

Bio: John's interest in astronomy was kindled during two great comet events – comets Hyakutake (1996) and Hale–Bopp (1997). For the next ten years he used a 2½-inch refractor borrowed from his brother which he mounted on a rickety camera tripod. It wasn't until 2009 that he acquired a serious telescope as a gift from his family. He started attending meetings of the Rochester Astronomy Club in 2002, becoming a member in 2006, and Vice President in 2019. In 2017, he chaired the NCRAL annual conference held at Eagle Bluff Environmental Center in Lanesboro, Minnesota, and served as NCRAL Vice Chair from 2017-2019. John's particular interest is the history of astronomy. (Three-year term as Regional Representative; currently in first term, 2022-2025)

Contact: john_attewell@hotmail.com

Webmaster: Jeff Setzer (appointed)

Bio: Jeff has been an amateur astronomer since 1984 and has been part of the *Northern Cross Science Foundation* (Wisconsin) since that time. He is a longtime member of their Board of Directors, has held several office positions, and is currently their President. He has completed several Astronomical League observing programs, made his own telescopes and optics, and is a self-described telescope nut. You will often find him at star parties with his 22" Starmaster and TeleVue 85 telescopes.

Contact: astrosetz@hotmail.com

