NORTHERN LIGHTS

NORTH CENTRAL REGION OF THE ASTRONOMICAL LEAGUE

Winter 2022 - Volume 6, Number 3

INSIDE THIS ISSUE OF *Northern Lights*

NCRAL CHAIR'S MESSAGE

Happy New Year to everyone! As we kick off 2022, here are a few notes and reminders for the year ahead.

I can only imagine that the membership is looking forward with great interest to our first Regional convention in three years – NCRAL 2022. You will recall that NCRAL 2020 and NCRAL 2021 were rescheduled and canceled, respectively. Three years is a long wait.

Make plans now to attend ***NCRAL VISION 2022***. This year's face-to-face event will be hosted by the *Northern Cross Science Foundation* and held at Port Washington, Wisconsin, May 13-14. I received word recently from Jeff Setzer that the ***NCRAL Vision 2022*** convention website and registration are up and running! Consider registering today.

Jeff also has updated the NCRAL website to reflect the most current information about a number of items. Follow this link for convention details: www.ncsf.info. Also, please follow this link, ncral.wordpress.com, for information about Regional events in the new year. If you have anything to add to our Regional calendar, please email Jeff directly at astrosetz@hotmail.com.

Looking ahead to the NCRAL 2022 business meeting in May, I'm alerting everyone to the fact that there will be an election for Regional Representative. Bill Davidson is currently in his last year of his second three-year term as Regional Representative (2019-2022). Bill continues in his second term as Vice Chair of the Region (2021-2023) and is eligible to run for a third term as Regional Representative.

March 31st is the nomination deadline for the Region and Newsletter Editor Awards. This date is also the last day for affiliates to apply for the membership and affiliate recruitment mini grants. Recent successes with of each type of grant are described later in this issue of ***North Lights***.

Here are some additional updates about where the North Central Region of the Astronomical League is heading during the remainder of my third and final two-year term as Regional Chair:

NCRAL Donation System: Recall that the North Central Region is now accepting tax-deductible contributions as part of its 501(c)(3) status that comes through our affiliation with the Astronomical League. Please consider "dropping a few bills in the till" by sending your donation to Treasurer Roy Gustafson. You may email him at astroroy46@gmail.com.

NCRAL 5-year Plan: I asked the membership in my Autumn 2021 Chair's message to send me ideas for a potential 5-year plan. Having heard nothing from our 1,900-member Regional membership, I have decided that the membership does not think this idea worthy of pursuit. I will therefore dispense with it.

Amending the Region's Bylaws: Given that NCRAL Bylaws are based on the Astronomical League Bylaws, we will wait to see what happens with the national governing document before making changes in our Regional governing document.

Seasonal Mini Marathons: This past summer, I started putting together four seasonal NGC mini marathon observing programs. Having worked my way through the autumn list, I have found that there are insufficient NGC objects for autumn make up a suitable mini marathon based solely on NGC objects. It's not that there are insufficient candidates; that's not the case with over 7000 NGC objects. What's the problem is having sufficient numbers of *worthy* candidates to observe.

Most NGC objects are too faint to observe in typical amateur instruments of 8" to 12" aperture. I've therefore decided to morph these new NGC observing programs into "the best of" non-Messier sets of objects (e.g., NGC, Cr, IC, etc.) and will relabel this tentative program series "Seasonal

Bucket List Mini Marathons." This seems only appropriate as I'm basing the program on my draft Astronomical Bucket List that never produced much interest among NCRAL members. Hopefully, this new series of mini marathons will produce the desired effect. I will continue to work on the Bucket List mini marathons and will report more fully after I've had additional opportunities to work on this new program. For now, I'm suspending reporting on this new observing program.

The December 2021 issue of the Astronomical League's ***Reflector*** magazine arrived by US Mail in mid-December. It can be accessed online if you have not yet received your copy. (It can take months for new affiliate members to receive their first copy due to the way membership renewals occur.) Regardless, NCRAL affiliate members can download electronic copies at https://www.astroleague.org/reflector/december-2021-reflector-magazine. There is a lot of useful information in this issue, so be certain to read it.

One thing of note in the December issue of ***Reflector*** is a listing of the NCRAL affiliates that provided door prizes for ALCON 2021. I'd like to acknowledge these generous donors here: *Milwaukee Astronomical Society, Neville Public Museum Astronomical Society, Northwest Suburban Astronomers,* and *Twin City Amateur Astronomers.* Also note the deadlines for the various A.L. awards program and how to win a library telescope. Each of A.L. eleven regions is eligible to receive one, but none of the NCRAL affiliates applied in 2021. Only six of eleven available library telescopes were awarded as a result. I'm encouraging all groups to consider applying for a library telescope. Details about the library telescope program can be found here.

So, that's about all I have to say for now. Enjoy this issue of ***Northern Lights***.

Clear skies and keep looking up!

Carl

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Carl J. Wenning
NCRAL Chair (2017-2023)
carlwenning@gmail.com

NCRAL Financial Statement Autumn 2021

~ Reported by Treasurer Roy Gustafson ~

Check #	Date	Description	Check Amount	Deposit	Daily Balance	Monthly Balance
	1-Sep-21					$8,447.26
	30-Sep-21					$8,447.26
	31-Oct-21					$8,447.26
	30-Nov-21					$8,447.26

NCRAL VISION 2022 Coming May 13-14

~ by Jeff Setzer, Northern Cross Science Foundation ~

After the Covid-19 pandemic forced us to cancel our NCRAL 2020 convention, it has been re-born as the NCRAL 2022 convention! The *Northern Cross Science* Foundation is pleased to be hosting the first in-person AL-related convention since 2019. Our theme is ***Vision 2022*** which will have new meaning in a post-pandemic world. We have re-confirmed an exciting list of core speakers:

- Dr. William Dirienzo, Assistant Professor of Physics & Astronomy at University of Wisconsin-Sheboygan
- Kate Meredith, Founder & Director of Education at Geneva Lake Astrophysics & STEAM
- David Prosper, Program Manager for Amateur Astronomy at the Astronomical Society of the Pacific & Administrator of the NASA Night Sky Network: *The Latest From The NASA Night Sky Network*
- Bob King, retired photo editor of the *Duluth News Tribune,* publisher of "Astro Bob" blog since 2008, contributing author for *Sky & Telescope* and *Universe Today,* author of *The Night Sky With The Naked Eye* and *Wonders of The Night Sky You Must See Before You Die.*
- Brandon Hamil, Minnesota Astronomical Society: *The Traveling Astronomer*
- Banquet Speaker: Dr. Francis Halzen, Gregory Breit Professor and Hilldale Professor at University of Wisconsin-Madison, and Principal Investigator of the IceCube Neutrino Observatory in Antarctica

Additional activities on Friday include a tour of the Jim & Gwen Plunkett Observatory at nearby Harrington Beach State Park, which features some upgrades to the building and the instrumentation since our previous NCRAL hosting. See our website for details and the latest updates.

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 Utica, Illinois, Grand Bear Resort: Twin City Amateur Astronomers (May 5-6)
- 2024 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 the NCRAL 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.

CALL FOR 2022 NCRAL NOMINATIONS & APPLICATIONS

REGIONAL REPRESENTATIVE/REGION AWARD/NEWSLETTER EDITOR AWARD/MINI-GRANTS

The term of NCRAL's Regional Representative ends with the next Regional Business Meeting on May 13th. Either Bill Davidson will be returned to this position, or another candidate will be elected to fill this position. I've yet to hear from Bill whether he's willing to continue in office but will have this information squared away by the time of the Spring 2022 newsletter which will be distributed just shy of two months prior to **NCRAL Vision 2022**.

It's never too early to start thinking about nominations for the NCRAL Region Award. Do you know someone who has dedicated his or her time and energy to promoting astronomy? Wouldn't you like to let them know they are appreciated for their arduous work? This is your chance! This award recognizes exceptional individual effort and meritorious service to amateur astronomy through the member's local astronomy club, public outreach, the NCRAL, or the Astronomical League.

The Regional is now calling for nominations for the 2022 Region Award. Using the guidelines and submission forms below, we have made it easier than ever to nominate someone you feel deserves this award. This award will be presented in a ceremony concluding the dinner banquet of the next Regional convention, NCRAL VISION 2022, to be held at Port Washington, Wisconsin, May 13-14.

The Rules for nomination are as follows:

1. The individual must be a member in good standing, either through an AL/NCRAL-affiliated club, association, or society or as a current member-at-large in the North Central Region.
2. The three current regional officers and the regional representative are NOT eligible for this award. Past winners are also ineligible for this award.
3. The regional officers are the voters and will base their decision on the information provided. Past winners of this award will be asked to assist in the case of a tie vote. Each member votes independently and will use his/her best judgment. All decisions are final.
4. The winner will be contacted not less than 21 days in advance of the NCRAL meeting at which the award will be presented. The winner will not be publicly revealed until the time of the presentation. Those nominated but not selected will not be revealed.
5. All non-winning nominations will be kept on file for two years after the initial submission. After such time, a new nomination needs to be competed. Nominations for the 2022 Region Award MUST BE RECEIVED by March 31st. Any nominations received after this date will be kept on file for 2023.

There are many deserving candidates within NCRAL. We look forward to receiving your nomination(s). If there are any questions, please contact Vice Chair Bill Davidson via phone or email using the contact information found below.

NOTE: *Recipients of NCRAL's 2020 and NCRAL 2021 Region and Newsletter Awards will receive their plaques or certificates at NCRAL VISION 2022.*

Submission Form for the NCRAL Region Award

Nominee's name (as it will appear on plaque) _____

Nominee's email address _____

Street address _____

City _____ State _____ Zip _____

Club affiliation _____

Nominator's name _____

Club affiliation _____

Street _____

City _____ State _____ Zip _____

Phone _____

Email _____

Date of Nomination _____

Submission Guidelines

Prepare a *statement of the nominee's accomplishments* in one or more of the areas listed under the criteria described in first paragraph on page 1. This statement should:

- Not exceed 3 double-spaced pages (1,000 words). Length does not necessarily equal strength.
- Include the number of years in office or committee membership.
- Include the dates of said membership.
- Include the length of time participating in public education, number of presentations, etc.

and should include *supporting data:*

- Any relevant newspaper clippings, photos, and other articles that support the nomination.
- For service to groups such as schools, scouts, etc., it would help the committee if you could obtain a brief statement from the teacher, leader, chair etc. on the usefulness of the presentation.

All nominations must be sent via email to Bill Davidson, NCRAL Vice Chair, at rochesterskies@outlook.com

Let's not forget about the **NCRAL Newsletter Editor Award**. It is expected that the next award will be conferred at the NCRAL 2022 meeting. Submission Guidelines: The president of the club/society/association should email a copy of the designated issue of the associated newsletter in Adobe Acrobat pdf file format to NCRAL Vice Chair Bill Davidson (rochesterskies@outlook.com), along with a cover letter of recommendation in the same file format. In addition, complete contact information of the editor must be included. A photo of the newsletter editor, preferably in an astronomical-type setting, must be received electronically in jpg format to the same email address by March 31st.

Lastly, don't about the two **NCRAL mini grants**. A mini grant will be awarded following a successful written proposal originating with the president of an NCRAL affiliate. The focus of a mini-grant must be oriented to an increase in either: (1) an affiliate's membership whose mini-grant proposal must focus on both recruitment and retention (Member Recruitment & Retention Mini-grant), or (2) an increase in the number of A.L.-affiliated clubs, societies, or associations within the North Central Region (Non-affiliate Recruitment Mini-grant). A unified online mini-grant application must be completed by the deadline noted below. The application link may be found at the following URL: http://bit.ly/2W2pdeA Deadline: The application deadline for all mini-grants is March 31st. Mini-grants, if approved, will be announced at NCRAL VISION 2022.

Final Report: 2020 NCRAL-TCAA-ISUAC Affiliate Recruitment Mini Grant Outcome

~ by Carl Wenning, TCAA ~

The Twin City Amateur Astronomers (TCAA) received a $250 affiliate recruitment mini grant from NCRAL in May 2020. The mini grant was to be used during the 2020-2021 school year to recruit the nascent Illinois State University Astronomy Club (ISUAC) as the newest affiliate of NCRAL. Assisting with this effort was to be the Illinois State University Planetarium (ISUP), "home" of the ISUAC. With the ensuing pandemic, however, on-campus classes went online, and clubs were prohibited from gathering. The mini grant was put on indefinite hold due to the pandemic.

Finally, this past August 26th, the ISUAC had its first meeting in more than a year. Many earlier members had either graduated or did not otherwise return to the club with autumn semester 2021. Nonetheless, the group was reformulated with assistance of ISU Planetarium Director Tom Willmitch and ISUAC President Amy Saladino.

Tom invited the TCAA leadership to work with the reformulated club. TCAA leaders formally met with the ISUAC four times during the autumn semester. The first meeting was spent getting the ISUAC members to better understand the contents of TCAA Guide #4 – *The Art of Sky Interpretation*. Three subsequent meetings were spent going through TCAA Guide #1 – *Introduction to Amateur Astronomy*.

The TCAA also held multiple two sidewalk astronomy observing sessions outside the planetarium where many ISU student enthusiastically peered through the telescopes primarily that the moon, planets, and bright stars of interest. Unfortunately, the sky at night on the ISU campus is terribly light polluted, so it is unlikely that such future campus events will show more than this. That's not necessarily a problem though, as the ISU club members can easily find the moon and planet in the light-polluted sky.

To date, $218 of the $250 grant has been spent on publications for use with the club. TCAA Guide #4 and TCAA Guide #1 – 16-page and 58-page documents respectively – were expensive to print, but each ISUAC member now has a hard copy for future reference. The remaining $32 in our coffer will be used for a two-club social sometime in January 2022 when plans for the spring semester involving both clubs will be worked out.

TCAA Treasurer Dave Osenga and ISUAC President Amy Saladino addressing some of the information found in TCAA Guide #1.

The ISUAC has been collecting dues payments of $10 per semester or $15 per school year from which they have generated sufficient money to pay one-half of the expected $110 Astronomical League dues payment before the end of the school year. The TCAA will pay the other half, achieving the end and concluding this inaugural NCRAL Affiliate Recruitment mini grant.

ISU Astronomy Club members out for their first sidewalk astronomy program on September 9th. Included are TCAA Vice President Tom Willmitch (checkered shirt) and ISUAC President Amy Saladino.

2021 NCRAL-CUAS Membership Recruitment & Retention Mini Grant Update

~ by David Leake, Champaign-Urbana Astronomical Society ~

In the Autumn NCRAL newsletter, we elaborated on our use of a 2021 Membership Recruitment mini grant from the Region in the amount of $250. To recap, the Champaign-Urbana Astronomical Society (CUAS, Illinois) developed a full-color flier to be distributed in both towns, at the local planetarium, and to participants at our observatory open house events. The idea was to hand two fliers to each visitor with the charge that they keep one and then either post the other or give it to a friend. 250 fliers were duplicated on July 15th at a cost of $188. An image of the flier appeared in the autumn issue of ***Northern Lights***.

One of our retired members took fliers to the following locations: University of Illinois Astronomy Department, the Esquire Lounge, El Toro Bravo (a Mexican restaurant), and the Champaign Public Library. The planetarium director also put some in their brochure rack. CUAS routinely holds a weather-permitting observatory open house on the Saturday closest to the first quarter Moon. Those dates were September 11, October 9, and November 13. One of the realities of living in the Midwest is the weather and the latter two sessions were clouded out. We did have about 90 minutes of clear skies on September 11 and unfortunately the fliers weren't brought to the observatory that evening.

As part of the grant proposal, we also boosted a few posts on the club's Facebook page. To date these costs total $14. For the October 9 event, we reached 480 people, 81% of whom were men and the majority of these were between the ages of 18 to 24. We had 109 engagements and 106 reactions to the post. We will repeat this in the spring.

As to results, it is difficult to attribute new members to the flier distributions, but we did gain five new members between September 30 and November 9. We felt this was significant.

The club plans to continue flier distribution in early 2022 with our first open house being scheduled for March 12.

NOTEWORTHY!

The following NCRAL members were recognized for having completed Astronomical League observing programs in the December 2021 issue of *Reflector.* Congratulations to all for their many and varied successes!

Asterism Observing Program:
Jeff Moorhouse, La Crosse Area Astronomical Society

Binocular Double Star Observing Program:
Stephen Pavela, La Crosse Area Astronomical Society

Beyond Polaris Observing Program:
Anthony J. Kroes, Neville Public Museum Astronomical Society

Binocular Double Star Observing Program:
Jean Napp, Iowa County Astronomers

Citizen Science Special Program:
Anthony J. Kroes, Neville Public Museum Astronomical Society

Globular Cluster Observing Program:
Jeff Moorhouse, La Crosse Area Astronomical Society
Alan Sheidler, Popular Astronomy Club

Lunar Observing Program:
Stephen Pavela, La Crosse Area Astronomical Society
Trena Johnson, Minnesota Astronomical Society

Nova Observing Program:
Anthony J. Kroes, Gold, Neville Public Museum Astronomical Society

Outreach Observing Award (O):
Byron Davies, Popular Astronomy Club
Hugh Holt, Popular Astronomy Club
Wanda Gacioch, Popular Astronomy Club
Paul Levesque, Popular Astronomy Club
Tim Holt, Popular Astronomy Club
Mike Gacioch, Popular Astronomy Club
Trena Johnson, Minnesota Astronomical Society

Two in the View Observing Program:
Kevin Nasal, Neville Public Museum Astronomical Society

Master Observing Progression

OBSERVER AWARD:
Kevin Nasal, Neville Public Museum Astronomical Society

NCRAL Seasonal Messier Mini Marathon Awards – Summer & Autumn 2021

The following individuals have qualified for NCRAL's **Summer and Autumn Messier Mini Marathon** certificates and pins. The suffix letter "A" indicates assisted observations, and "U" indicates unassisted. Congratulations to our successful observers!

Summer:

10. *Venkat Chander*, Twin City Amateur Astronomers (A)
11. *Sunil Chebolu*, Twin City Amateur Astronomers (A)

Autumn:

10. *Kevin Habhegger*, La Cross Area Astronomical Society (A)

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)

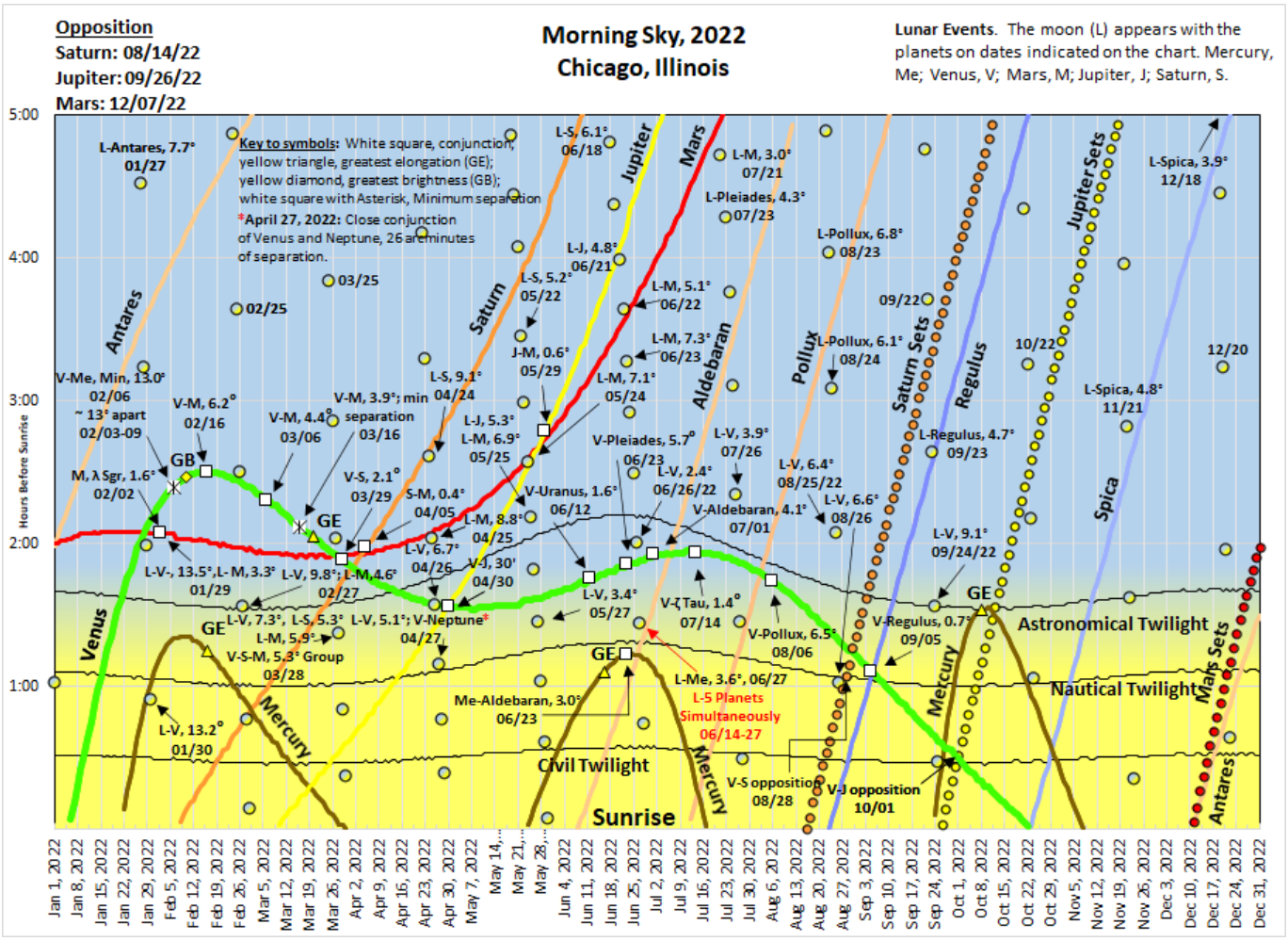
Summer: M83, M102, M5, M13, M92, M9, M10, M12, M14, M19, M62, M107, M4, M6, M7, M80, M16, M8, M17, M18, M20, M21, M22, M23, M24, M25, M28, and M54. (28 objects)

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.*

2022: MORNING PLANET BALLET

~ by Jeffrey L. Hunt ~



This chart shows the rising time intervals, compared to sunrise, for the five naked-eye planets, moon, and bright stars near the ecliptic. Setting time intervals for Mars, Jupiter, and Saturn are charted, when they set in the western sky. The diagram, for Chicago, Illinois, is computed from U.S. Naval Observatory data.

The chart above shows the rising time intervals, before sunrise, for the five naked-eye planets, moon (circles), and bright stars near the ecliptic during the year 2022. The time intervals for the three phases of twilight are indicated as well. The setting time intervals, compared to sunrise, for Saturn, Jupiter, and Mars in the western sky, are included as well. When a planet sets at sunrise, it is at its opposition.

The nature of the chart indicates that, besides the three planets setting in the western sky, the activity is in the eastern sky before sunrise.

Notes on the chart indicate interesting events, such as conjunctions, close approaches, and groupings of planets, stars, and the moon. The morning sky during 2022 is full of bright planets. Nearly every morning the planet separations are notable and more fascinating as Saturn and Jupiter enter the dance before sunrise.

Data for the chart is from the U.S. Naval Observatory. Many thanks to Robert C. Victor for his kind comments and suggestions for additions to the chart.

December 2021

The year ends with Mars (m = 1.5) climbing into the morning sky among the stars of Scorpius. After moving into Ophiuchus, the Red Planet passes Antares on December 27. On New Year's Eve morning the moon is to the upper right of Mars and the upper left of Antares.

In the evening sky, four bright planets – Jupiter (m = −2.1), Saturn (m = 0.7), Venus (m = −4.7), and Mercury (m =

−0.7) – are dancing in the southwestern sky. Jupiter and Saturn generally follow the westward migration of the stars. Since October 1, Jupiter has opened its gap to Saturn from 15.9° to 18.6° of ecliptic longitude. Jupiter is moving eastward in Aquarius, while Saturn is in mid-Capricornus.

On December 31, Jupiter is about one-third of the way up in the south-southwest sky as night falls. On that evening Saturn is over 16° up in the southwest.

Venus began retrograding December 18 and seemingly falls toward its inferior conjunction early next month. From the solstice until year's end, the planet sets nearly an hour earlier. Look for Mercury passing Venus during the last four evenings of the year. Be sure to check out the Venusian thinning crescent through a telescope.

On New Year's Eve, Venus and Mercury are only about 5° up during mid-twilight, while Jupiter and Saturn are higher in the southwest. On this evening, Venus sets only 70 minutes after sunset.

2022: The New Year

The new year promises considerable planet activity in the morning sky following the exit of Venus, Mercury, Saturn, and Jupiter from the southwestern evening sky.

January

Mars continues its slow climb into the morning sky. While Scorpius appears higher each morning at the same time interval before sunrise, Mars seems to stay about 10° above the horizon at 45 minutes before sunrise. The planet moves eastward in Ophiuchus, rising only one minute earlier every two days.

Look for the moon with the evening planets January 3-5 but try about 30 minutes after sunset for the lunar crescent with Venus and Mercury on the 3rd. Look for the moon near Saturn on January 4 and Jupiter (m = −2.0) the next evening when the sky is darker.

Mercury reaches its evening greatest elongation on January 7. The speedy planet moves to 3.4° of Saturn on January 12, a quasi-conjunction.

Venus passes inferior conjunction on January 8 and springs into the morning sky. Within a week, find it low in the east-southeast at about 30 minutes before sunrise. Two weeks after its solar conjunction, Venus rises 100 minutes before sunrise. At forty-five minutes before sunup on this morning it is over 8° up in the east-southeast, 15.2° to the lower left of Mars.

Mercury fades and disappears from the southwestern evening sky after mid-month.

As Venus appears in the east-southeast, watch its phase grown each morning when viewed through a telescope. On January 15, the planet is 2% illuminated. By month's end the morning crescent is 15% lit.

The ninth classic planet, Pluto, is at its solar conjunction on January 16.

Saturn follows Mercury into evening twilight. It sets at Nautical Twilight (66 minutes after sunset) on January 22. On this evening Jupiter sets over 160 minutes after sundown.

Mercury is at inferior conjunction, January 23.

On January 28, Venus (m = −4.8) and Mars rise at the same time, 124 minutes before sunrise. An hour before sunup, they are about 10° above the horizon with the crescent moon nearby.

The next morning, Venus is over 12° up in the southeast at 45 minutes before sunrise. It is 10.4° to the upper left of Mars and 13.5° to the upper left of the crescent moon. The lunar slice is 3.3° to the lower right of the Red Planet.

Venus ends retrograde motion and resumes its eastward direction on January 30.

February

In the evening sky, Jupiter is the lone bright planet. Look for the lunar crescent, 4.5° to its lower left on February 2.

Before sunrise, Mars slowly marches eastward through Sagittarius. It passes 1.6° to the upper left of Kaus Borealis (λ Sgr, m = 2.8), the star at the top of the Teapot of Sagittarius on February 2.

From the 2nd through the 9th, Mercury (m = 0.9-0.1) is about 13° to the lower left of brilliant Venus.

Saturn reaches it solar conjunction on February 4 and begins a slow crawl into the morning sky. It rises at Nautical Twilight (60 minutes before sunup) on March 5.

On February 5, Venus (m = −4.9) begins its interval of greatest brightness that lasts until February 14. February 10 is marked on the rising chart above to indicate the approximate mid-point. At 45 minutes before sunrise, Venus is nearly 15° in altitude in the southeast. It is 13.0° to the upper right of Mercury and 7.8° to the upper left of Mars. On February 13, Venus reaches its greatest rising time interval before sunrise, 2.5 hours. This occurs for another six mornings.

On Valentine's Day morning, Venus displays its greatest illuminated extent; that is, the illuminated phase covers the largest area of the sky. This event occurs when the morning crescent phase is 27% illuminated and 39 arcseconds across from cusp to cusp. The planet has an elongation of 40°. For a more detailed explanation of this event see: https://bit.ly/venus-greatest-illuminated

As Venus (m = −4.8) picks up eastward speed along the ecliptic from ending its retrograde direction, Mars (m = 1.3) moves past the brilliant planet in a second conjunction of a triple conjunction on February 16. The gap is wide, 6.2°. The

first conjunction occurred on July 12, 2021, as Mars headed toward its solar conjunction. At forty-five minutes before sunup, Venus is over 15° up in the southeast. Mars is to the lower right. On this morning, Mercury is over 15° to the lower left of Venus. The speedy planet reaches its greatest elongation (26.3°) today. This evening Jupiter sets at Nautical Twilight.

Jupiter sets at Civil Twilight on February 25.

On February 27, Venus, Mars, and the crescent moon make nearly a vertical line in the southeast. Venus is about 5° above Mars that is about the same distance above the lunar crescent.

March

Jupiter is at its solar conjunction on March 5, beginning its morning appearance.

On March 6, Venus (m = −4.7) passes 4.4° to the upper left of Mars (m = 1.2) for the third conjunction in the triple conjunction sequence. During the next ten days Venus is east of Mars, but its celestial latitude declines. The gap between the two planets closes to 3.9° on March 16, a close approach, but not a quasi-conjunction. Find Venus about 13° up in the southeast.

Neptune is at its solar conjunction on March 12.

On March 20, Venus (m = −4.5) reaches its morning greatest elongation, 46.6° west of the sun. It is over 12° up in the east-southeast, 4.1° to the upper left of Mars (m = 1.1) and 8.2° to the upper right of Saturn. Venus rises about two hours before sunrise.

Jupiter rises at Civil Twilight (March 25), 27 minutes before sunup.

March 28, one morning before the Venus – Saturn conjunction, the moon joins the three morning planets. Venus (m = −4.4) is 11.0° up in the east-southeast. Mars is 5.3° to the right of Venus, while Saturn (m = 0.8) is 2.1° to the lower right of the Morning Star. They easily fit into a binocular field, although the crescent moon, 4.9° above the horizon, is 7.3° to the lower right of Venus and outside the field of view of the planet trio. Either the three planets fit into the same field or Saturn, Mars, and the moon fit, but not the quartet. The next time this planetary trio is bunched this closely is September 6, 2040. Shortly after sunset on that evening, Venus is about 4° up in the west with Saturn 1.5° to the upper right and Mars 3.4° to the left of the brilliant planet. These planets fit into a circle 4.2° in diameter. Additionally, Jupiter is 5.4° to the lower right of Venus, near the horizon. Two evenings later, the crescent moon joins the planet pack, making a pretty view through a binocular.

The next morning (March 20), Venus passes 2.1° to the upper left of Saturn. The gap to Mars is 5.3°.

The planetary dance continues into the spring with more conjunctions, Mars – Saturn, Venus – Jupiter, and Jupiter – Mars. During the month, step outside before sunrise to see the bright planets dancing in the southeastern sky.

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 Website

~ by Jeff Setzer ~

Go to ncral.wordpress.com and you'll see a central repository for information about our Region and affiliates, the Region's Bylaws, back issues of ***Northern Lights***, information about observing programs, awards, and grants, and much more.

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 helping nascent amateur astronomers with observing. He has been involved with the Twin City Astronomers of Bloomington-Normal (Illinois) since September 1978. He was recognized for his education and outreach efforts in 2007 when he received the ***NCRAL Region Award***. He served as NCRAL Regional Chair from 2017-2021 and was re-elected for his third and final two-year term in 2021. 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 also served as the ***Northern Lights*** newsletter editor from 2016 to present. Carl was planetarium director (1978-2000) and physics teacher educator (1994-2008) at Illinois State University. He continues to teach physics education courses in retirement. He just finished his 44th year of college teaching. (Two-year term as Chair, currently in third and final term, 2017-2023; appointed newsletter editor)

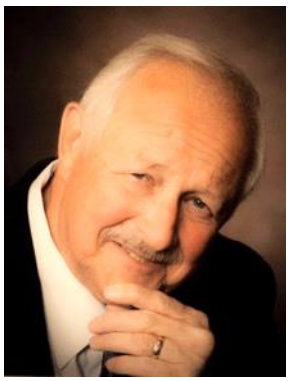
Contact: carlwenning@gmail.com

Vice-Chair and **Region Representative:** **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 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; three-year term as Regional Representative, currently in second term, 2019-2022)

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. (Three-year term, currently in second term, 2018-2024)

Contact: astroroy46@gmail.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

