NORTHERN LIGHTS
NORTH CENTRAL REGION OF THE ASTRONOMICAL LEAGUE
Autumn 2018 - Series II , Volume 3, No. 2

NCRAL CHAIR'S MESSAGE

Summer has come and gone, and now autumn begins. A lot has happened over the past three months. One of the most significant was ALCon 2018 which was hosted in our Region by the Minnesota Astronomical Society in Minneapolis from July 12-14. Sara Sheidler of Popular Astronomy Club (PAC, Rock Island-Moline, IL) wrote about this event and you may read her article later on in this issue of ***Northern Lights***.

Immediately prior to the start of ALCon 2018, NCRAL Representative to the AL Council Bill Davidson and yours truly (serving as NCRAL Chair) attended the AL's National Council meeting. The meeting began at 8:30 AM on Wednesday, July 11th and continued with a few short breaks until 5:00 PM. There are many important things worthy of note, but of particular note is that next year we will hold ALCon at NASA's Cape Kennedy in commemoration of the 50th anniversary of the Apollo 11 Moon landing. We will then move the main events to a cruise ship for a weekend trip to the Bahamas and back, offering the chance to observe at sea in very dark skies. Details will be forthcoming but make sure your passport is up to date to take part. More about the Council meeting later.

Given our Regional report published in the Summer issue of ***Northern Lights*** and subsequently provided to the Astronomical League National Council, AL President John Goss told me how pleased he was to see recent developments within the Region. So delighted was he in fact that he asked me to prepare a one-page article for ***REFLECTOR*** about NCRAL happenings. Hopefully this will shed some good limelight on the Region and serve as an exemplar for other regions.

Not to be overlooked is the fact that two of our Region's members were recognized by the Astronomical League during this year's convention. Terry Dufek of Popular Astronomy Club earned the prestigious 2018 Mabel Sterns Newsletter Editor Award and Richard Francini, Neville Public Museum Astronomical Society, was recognized with the 2018 Astronomics Sketching Award. Read more about their great accomplishments on page 3. Congratulations to both!

The day before the National Council meeting, I had a wonderful experience presenting to the Popular Astronomy Club in Moline, IL. I believe members from other clubs in the area were also present. I spoke about the benefits of membership in the Astronomical League and, by default, NCRAL. Thanks to NCRAL Secretary-Treasurer Roy Gustafson and his wife Jan for taking me in overnight (and stuffing me with both pork chops and chicken) and to PAC President Alan Sheidler and his wife Sara for arranging my visit (and stuffing me with pie).

ALCor Bill Davidson & Chair Carl Wenning after the Council Meeting

Over the summer, I kept up my efforts to remain in electronic communication with the membership. I sent out periodic calls for members to enroll in the NCRAL direct email list, to participate in the NCRAL Convention Preferences Survey, and to submit draft logos for NCRAL. I also used Facebook to send out reminders and provide observing activities for a number of sky events.

We are a Region nearly 1,900 strong, yet only a small percentage have responded to my repeated requests for participation in certain of our activities. For instance, only a few over 300 have signed up from the NCRAL direct email; only 65 completed the online NCRAL Convention Preferences Survey. Of course, part of this problem is not having a well-established communications network within NCRAL. We desperately need a direct communication system so that every member of every affiliate can get our newsletter and critical announcements in a timely fashion. From a show of hands at NCRAL 2018 at Sturgeon Bay, it's clear to me that

INSIDE THIS ISSUE OF *Northern Lights*

comparatively few individuals get and read the ***Northern Lights*** newsletter despite the fact this is the third year of its publication. I hope more people will get involved in the Region.

How can you get involved going forward? Read this newsletter from first to last page. Print it out and peruse it from time to time. It's much too long to take in all at one viewing. Look for the articles about signing up for NCRAL direct email (it's not too late), participate in the NCRAL logo selection process (6 logo proposals from 4 individuals; the opportunity for submissions is now closed), get your affiliate to apply for one or both NCRAL mini grants (one for member recruitment & retention and the other for affiliate recruitment), and put the NCRAL 2019 dates into your schedule (May 3-5 in Moline, IL).

Our recent *Convention Preferences Survey* shows that the biggest reason people do not attend NCRAL conventions is due to schedule conflicts. Get the dates into your schedule now so this won't happen to you next year. Our host, the Popular Astronomy Club of Rock Island-Moline, IL, has something special planned. With my approval and support, PAC will be varying the ways we've always done things and are trying something new. See the *First Update* announcement latter in this issue of the newsletter.

Hopefully, members will get out to observe more now with the more transparent skies of September, October, and November. The haze from the forest and range fires out West that really put the kibosh on observing toward the latter half of summer has now subsided.

Clear skies!

Carl J. Wenning
NCRAL Chair (2017-2019)

NEWS FROM THE AL NATIONAL COUNCIL MEETING

NCRAL's Representative to the AL Council Bill Davidson and NCRAL Chair Carl Wenning attended the AL's National Council meeting on July 11th in Minneapolis. Provided here is a very brief summary of the meeting's main contents…

The meeting was chaired by outgoing AL President John Goss whose term would end on September 1st. Bill Bogardus is now AL president. John opened the meeting with the note that we need to get more people involved with AL activities, and this topic would appear several times throughout the day as various ideas were addressed.

Much of the morning was taken up with discussion of setting directions, dealing with day-to-day matters such as membership, budget, Internet security, privacy, staffing, cost savings, publications, reports, awards, observing programs, ALCon 2019 beginning at KSC, and so on and so forth. Several new initiatives were addressed after lunch. Among them were the following:

- Development of activities of the *Sky Puppies* observing program that might be conducted in small workshops associated with future ALCons. Peggy Walker (chair), John Goss, Mitch Glaze, and Carl Wenning will serve on an ad hoc Youth Activities Committee to do such.
- Carl Wenning pointed out that he had earlier written an introductory telescopic observing manual, *The Galileo Guide to the Heavens*, that might be used by the League to provide additional observing activities for use with Galileoscopes. He will pursue this activity on behalf of the League.
- John Goss pointed out that NCRAL's Region Report was replete with lots of interesting activities that other regions might want to emulate.
- Two AL Honorary Membership Awards were received and approved.

Watch future issues of ***REFLECTOR*** for details to emerge from the National Council Meeting.

TWO NCRAL MEMBERS HONORED AT ALCON 2018

2018 Mabel Sterns Newsletter Editor Award

First Place: ***Reflections***, by Terry Dufek, Popular Astronomy Club, Rock Island-Moline, Illinois.

The newsletter editor performs the primary function of informing astronomy club members about what is happening in their club. Often the editor is forced to become quite creative in filling the allotted space for each issue when the call for articles doesn't quite fill up the publication.

Reflections

Newsletter of the Popular Astronomy Club APRIL 2018

President's Corner April 2018

Alan Sheidler

The month of March has been quite a month and Terry Dufek's April issue of "Reflections" ably documents the past month's activities of the Popular Astronomy Club which have been many and varied. The Popular Astronomy Club is a very active group of amateurs engaged in all sorts of activities including public outreach, club meetings, public and private observing sessions and educational pursuits as well. I am very proud to be associated with such an enthusiastic and accomplished group. Take a few moments and read about Imagination Station, the first Niabi Zoo public observing session of 2018, the March Club meeting and club member observing sessions which are so well documented here in "Reflections". I'm biased perhaps, but I don't think I'm exaggerating by asserting PAC is one of the most active astronomy clubs in the Astronomical League.

2018 is, indeed, shaping up to be a busy one for PAC. But the big news is that PAC members have approved the AL's request to be host for the NCRAL 2019 convention which is scheduled for May 3-4, 2019. We have signed a contract with Stoney Creek Convention Center, Moline to be the site for the convention.

(Continued in next column)

The theme for our NCRAL 2019 is "Astronomical Voyages of Discovery: Past, Present & Future". We have already contacted many speakers who have expressed the desire to attend and enthusiasm to present on a variety of topics including Apollo 11, exoplanets, radio astronomy, meteorites, the Eddington eclipse expedition, Christopher Columbus, multi-messenger astronomy, NASA program updates, American Indian views of Astronomy, student projects and much more.

NCRAL 2019 is a great opportunity for amateur astronomers to convene, do talks, network and enjoy fellowship. The program for NCRAL 2019 is starting to come together nicely, but to me PAC's NCRAL convention is a great opportunity to showcase the uniqueness the Quad Cities has to offer, astronomical and otherwise. Think about it. The Quad Cities is smack dab in the middle of everything. There are observatories, planetariums, museums, river boat cruises, factory tours, and much more for guests to see in the Quad Cities. All of these things are likely to be considered as optional visits and tours for visitors to NCRAL 2019.

While NCRAL 2019 is beginning to shape up nicely, we still have much to do. This is an opportunity for you to "strut your stuff", show off your pride in your community,

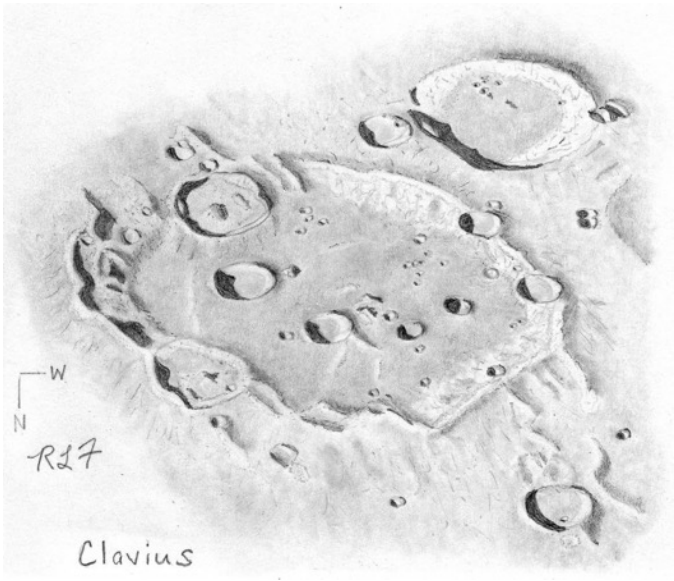
(Continued on next page)

1

In acknowledgement of the important role of the newsletter editor, in 1988, the Astronomical League established the Mabel Sterns Newsletter Editor Award to recognize these essential people. The Award is named in honor of the first newsletter editor of the League, Mabel Sterns, who served in that capacity from 1948-1952.

2018 Astronomics Sketching Award

First Place: $250. *Clavius Crater System*, by Richard Francini, Neville Public Museum Astronomical Society, Green Bay, WI.



Richard writes, "Using a 13-inch Dobsonian from De Pere, WI on Jan. 28, 2018, 2:00 to 6:30 UT. Seeing was a (1-) and improved to 1 for about 90 minutes (near perfect seeing conditions!), transparency 18.7 SQM with 2/3 moon. Rock steady images with 5.5 mm and 4.8 mm eyepieces giving 300 and 355 power. Total time: about 9 hours! Pencil on paper."

ALCON 2018: WHERE THE PLANETS WILL SHINE OVER EAGLE LAKE OBSERVATORY

~ by Sara Sheidler, Popular Astronomy Club ~

ALCon 2018 was held in our NCRAL region and hosted by the Minnesota Astronomical Society in Minneapolis from July 11-14, 2018. Day 1 was devoted to the AL Council Meeting attended by our Chair Carl Wenning and Representative Bill Davidson. We drove the six hours from Moline, Illinois, and arrived that evening. The conference was held at the Hilton - Mall of America. They had spacious conference rooms and spaces for the various vendors who were there. A historic telescope display was set up by MAS members which brought back memories for many attendees. The count was approximately 350 people from 25 states and several foreign countries. From our NCRAL region we had a good representation.

This report is not intended to be all-inclusive, but a snap shot of the various speakers and events we attended. We attended many of the lectures given during the three-day event. The wide variety included local MAS members, educators from the Minneapolis area universities, some well-known astronomers, and even an ophthalmologist from Mayo Clinic. The MAS members included Dave Tosteson, Ron Schmit, and Brandon Hamil. Dave's talk, *Connecting with the Deep Sky*, dealt with pushing the limits of visual deep-sky observing. Ron's talk, *Outreach: Making the Cosmic Connection*, dealt with the thrill of outreach, education, and connecting with all ages. Brandon's presentation, *The Traveling Astronomer*, was about his unique travel experiences while visiting various observatories and amateur clubs while on business trips.

Educators included Lou Mayo, who spoke about NASA's Space Science Education Program and how NASA and the Astronomical League are partnering on astronomy education. Terry Jones' talk, *Mass Loss in Hypergiants*, delved into how massive stars can lose up to half of their matter at the end of their lifespans and the significant impact this has on the interstellar medium. Clement Pryke's program, *Pursuing the Shadows of Gravitational Waves from the Beginning of Time from the South Pole,* was a particularly interesting talk about his research into the cosmic microwave background and the rigors of doing astronomy from Antarctica. Lawrence Rudnick captured our imaginations as he asked whether we (life on Earth) are special or an accident in his talk entitled *Too Good to be True*.

Cristin Finnigan, paralegal and M.S. student, gave a talk entitled *Space Law 101* during which she described the treaties and legislation that various countries have adopted since space exploration began and what may be needed as the shift to future commercial ventures including asteroid mining and human settlement are considered. Jay McLaren, Professor of Ophthalmology at Mayo Clinic, gave an informative talk titled *The Eye as an Astronomic Instrument* in which we learned how the eye works and how we can optimize the performance of our eyes for astronomical endeavors. Evan Skillman, Professor and Director of Physics and Astronomy at University of Minnesota Institute for Astrophysics, gave a program titled *The Panchromatic Hubble Andromeda Treasury Program* which was about the work done cataloguing star clusters in M31.

One of the most interesting talks was given at the Eagle Lake "Hot Spot" which is a climate-controlled classroom next to the MAS observatory. In the talk *Little Things Make A Big Difference*, Pranvera Hyseni talked about the history of astronomy in Kosovo. Pranvera is the founder and director of the Astronomy Outreach of Kosovo, which is the largest non-profit astronomy outreach enterprise in Kosovo. Her mission is to educate and inspire others "to change the world." She is on an information-gathering and fund-raising tour of the United States and plans to build the first observatory in Kosovo upon her return. At age 23, she is indeed inspirational! Richard Schmude gave an engaging presentation about the polar regions of Mars and talked about the year-to-year changes in the polar caps and dust storms. He gave the audience a multiple-choice quiz to test their knowledge and everyone enjoyed the discussion.

While we were there, we toured the Eagle Lake Observatory which has a domed observatory and a roll-off observatory with a telescoping, arch-shaped roof. These facilities house an array of state-of-the-art telescopes for visual, solar and imaging work. As luck would have it, the sky cleared to afford us fantastic views of the planets Mercury, Venus, Jupiter, and Saturn. Views of Mars and deep sky objects were also enjoyed by those that remained for the nighttime observing session. This is really a nice location and far enough from the city to afford dark sky conditions. Very nice indeed!

There were several other talks and panel discussions given by respected authorities in the astronomy field including *Astronomy* magazine's Bob Berman, YouTube astronomy host Phil Plait, astronomy professor/columnist Bob King, and MAS's own Ron Schmit. The keynote speaker was Pamela Gay who gave an engaging after-dinner talk titled *A Brief History of Great Amateur Achievements in Science.*

One of the most anticipated events of any ALCon is the announcement of the recipients of the coveted AL awards and scholarships. This year, the North Central Region is very proud to have a number of newly minted Master Observers and a recipient of the Mabel Sterns Newsletter Editor Award. Terry Dufek from the Popular Astronomy Club was this year's Mabel Sterns Newsletter Editor award recipient. Richard Francini, from the Neville Public Museum Astronomical Society, received the Astronomics sketching award. Our region's recipient of the Library Telescope funded by the Horkheimer Trust was the Marquette Astronomical Society. We can be very proud of these awards and celebrate the success of ALCon.

Newsletter editor Terry Dufek receives Mabel Sterns Award from PAC President Alan Sheidler shortly after ALCON 2019.

IT'S OFFICIAL: NCRAL AFFILIATES

Following the close of Astronomical League's dues assessment for 2018-2019, we find out that the Region has 36 official affiliates. They are given below. Our data have been used by Webmaster Jeff Setzer to update the NCRAL member societies website found at https://ncral.wordpress.com/members/. If you would like to see these data on the website further updated, please contact Jeff at astrosetz@hotmail.com. Official affiliate data were provided by the AL national office in Kansas City.

1. Ames Area Amateur Astronomers
2. Astronomical Association of Southern Illinois
3. Black Hawk Astronomy Club
4. Cedar Amateur Astronomers, Inc.
5. Champaign-Urbana Astronomical Society
6. Chicago Astronomical Society
7. Chippewa Valley Astronomical Society
8. Des Moines Astronomical Society, Inc.
9. Door Peninsula Astronomical Society
10. East Central Minnesota Astronomy Club
11. Fargo-Moorhead Astronomy Club
12. Fox Valley Sky Watchers
13. Iowa County Astronomers
14. LaCrosse Area Astronomical Society
15. Marquette Astronomical Society
16. Milwaukee Astronomical Society
17. Minnesota Astronomical Society
18. Naperville Astronomical Association
19. Nature Institute Astronomy Association, The
20. Neville Public Museum Astronomical Society
21. North East Wisconsin Stargazers
22. Northern Cross Science Foundation
23. Northwest Suburban Astronomers
24. Peoria Astronomical Society
25. Popular Astronomy Club
26. Racine Astronomical Society
27. River Bend Astronomy Club
28. Rochester Astronomy Club
29. Rockford Amateur Astronomers, Inc.
30. Sangamon Astronomical Society
31. Sheboygan Astronomical Society, Inc.
32. Skokie Valley Astronomers
33. Southeastern Iowa Astronomy Club
34. Steele County Astronomical Society
35. Twin City Amateur Astronomers, Inc.
36. Wehr Astronomical Society

NCRAL 2019 CONVENTION: CALL FOR PARTICIPANTS

~ by Mike Gacioch, Chairman, NCRAL 2019 ~

The November 1st opening of registration for the NCRAL 2019 Annual Convention ***Astronomical Voyages of Discovery: Past Present & Future*** hosted by the Popular Astronomy Club in Moline, Illinois is almost upon us. Plans are well on their way to being solidified. You are encouraged to sign up for the "First to Know" mailing list so you are aware of the latest news as it is posted on the Convention Website. Join the current astronomers on the mailing list from two regions, three states and six clubs/societies by emailing your name, club affiliation and email address to 2019NCRALInfo@gmail.com.

The convention is featuring a few activities this year to add an "attendee participation" element. To help us with planning, we'd appreciate your input on your potential participation. Please email me at 2019NCRALInfo@gmail.com if you think you, or in some cases your club, will participate in any these activities. We want to allow appropriate time and space which is dependent on the number of participants.

Club Trivia Competition – Friday evening we're planning a friendly Trivia competition among the clubs. You won't be left out if you are not affiliated with a club, there will be an "Independent Astronomers Team" formed. There might even be a "Students Team." The prize for winning is priceless . . . bragging rights! Perhaps a Trivia Competition can be a part of future conventions.

Do-it-Yourself (DIY) Displays – I've been reborn into astronomy for only a few years but have seen numerous DIY ideas that other astronomers use to enhance their viewing lives. Often products designed to make an astronomer's life easy or protect our equipment are expensive or non-existent. So, it would be great if you could bring your DIY or "alternate use of existing product" creation and share with your fellow astronomers. Part of the plan for Friday evening is to have designated club display areas so you can take turns protecting your creations and walking around. Some of the projects already expected to be on display are sun funnel, leveling feet, field power supply, pedestal extension, lighting solutions, and alternate use of off-the-

shelf padded cases for astronomy equipment. Too much to haul and set-up? Pictures with descriptions are an alternate to the real thing.

Best Practices in Outreach – One of the four cornerstones of amateur astronomy supported by the Astronomical League is *The Joy of Outreach*. I am sure outreach is a big part of what many of you do. In the spirit of improving outreach efforts in all communities, there will be an opportunity to share what your club/society is doing to promote astronomy to others. The Popular Astronomy Club (PAC) will be describing what goes on during the year with their PACMO (Mobile Observatory), but this session should not be only about PAC. We are requesting that someone from your club presents your activities, or supply information so we can develop a summary presentation of ideas.

Thank you in advance for joining us in Moline from May 3rd - 5th, 2019 and sending us input on these three activities.

Clear Skies!

Results of NCRAL Convention Preferences Survey

~ by Carl Wenning, NCRAL Chair ~

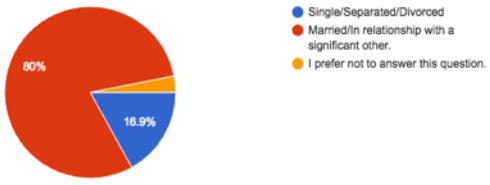
The nearly 1,900-member NCRAL membership was recently asked to complete a 30-question online Convention Preferences Survey. Sixty-five members took the opportunity to help the Region to improve future conventions by giving their input. We hope that the data obtained from this convenience sample will be both representative of the Region as a whole and helpful in producing Regional conventions that have broader appeal and accessibility.

The survey data are presented here in raw, unadulterated form. In a few instances, comments have been made following each set of respects to a selected question. These data will be used to improve the recently developed draft guidelines of the NCRAL Convention Planning Guide.

The first seven questions of the survey were designed to gather participant demographics.

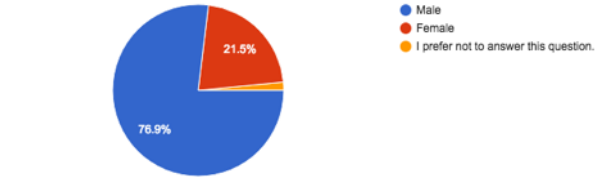
1. Please indicate your current marital status.

65 responses



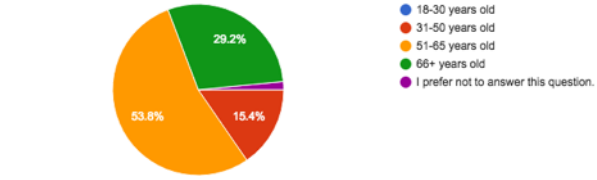
2. Please indicate your sex.

65 responses



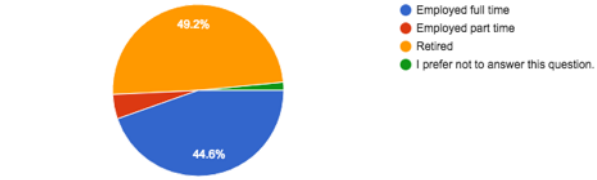
3. Pleased indicate your age range.

65 responses



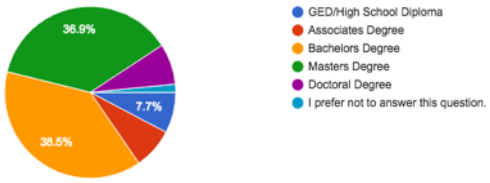
4. Please indicate your employment status.

65 responses



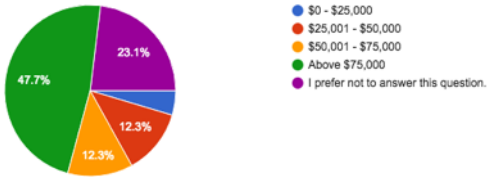
5. Please indicate the highest level of education you have attained.

65 responses



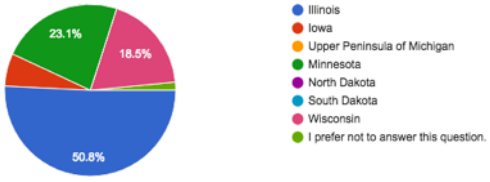
6. Please indicate your approximate annual household income from all sources.

65 responses



7. Please indicate the location of your NCRAL-affiliated astronomical society or where you live if you are a member-at-large.

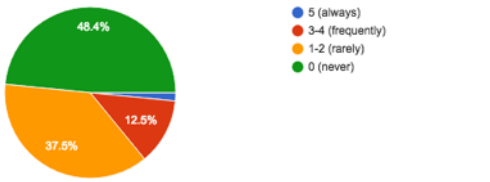
65 responses



Starting with question number 8, the survey addressed questions about who attends NCRAL conventions, how frequently, why they attend or don't attend, and how they both find out about and would prefer to find out about NCRAL conventions. Also asked are questions about impediments to attending, and what we might do to overcome at least some of those factors over which the Region has at least a small amount of control.

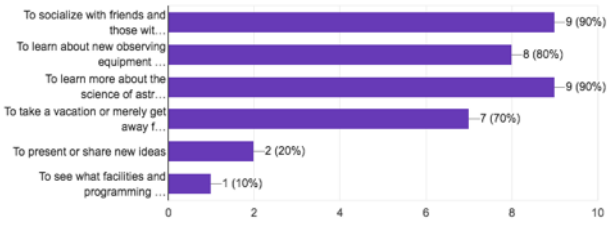
8. To the best of your recollection, how many of the last 5 NCRAL annual conventions have you attended? (2018...d for Fargo/Morehead, was canceled.)

64 responses



9. Please help us to understand why you always or frequently attend NCRAL annual conventions. Please check all that apply:

10 responses

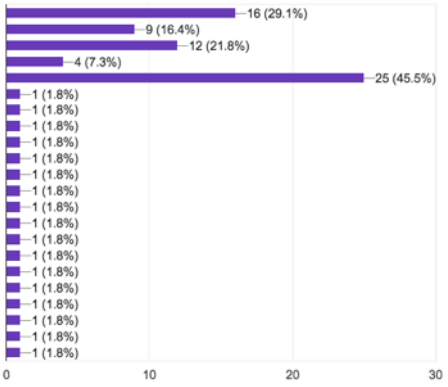


For clarity of the above bar chart, it should be noted that for those who always or frequently attend NCRAL annual conventions the complete responses were as follows: to socialize with friends and those with common interests – 9 (90%); to learn about new observing equipment and procedures – 8 (80%); to learn more about the science of astronomy – 9 (90%); and to take a vacation or merely to get away from home – 7 (70%). The other reasons had no strong "following."

A second question number 9 was asked of those who rarely or never attend NCRAL conventions with these results:

9. Please help us to understand why you rarely or never attend NCRAL annual conventions. Please check all that apply:

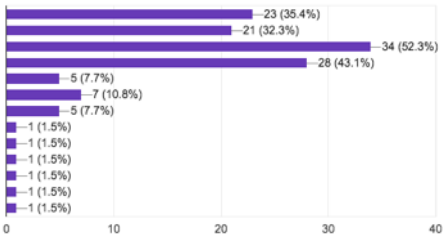
55 responses



The major reasons that survey participants do not regularly attend NCRAL conventions is because of the following reasons: I usually am not aware that there is an annual convention – 16 (29.1%); it is usually too far to travel – 9 (16.4%); it usually costs too much – 12 (21.8%); the topic usually don't interest me – 4 (7.3%), and I usually have a schedule conflict – 25 (45.5%). A number of other reasons were given, but there was no trend among those responses.

10. How do you typically find out about NCRAL conventions? Select all that apply.

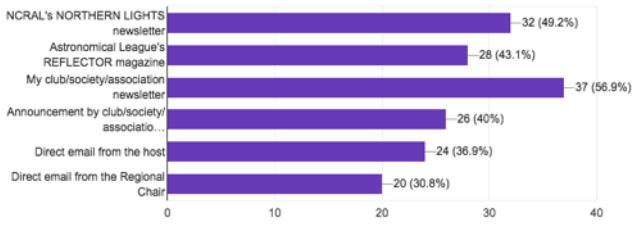
65 responses



The responses to the above question were as follows: NCRAL's ***Northern Lights*** newsletter – 23 (35.4%); Astronomical League's ***REFLECTOR*** magazine – 21 (32.3%); My club/society/association newsletter – 34 (52.3%); announcement by club/society/association officer or ALCor – 28 (43.1%); direct email from the host – 5 (7.7%); direct email from the Regional Chair – 7 (10.8%); and I don't typically find out about NCRAL conventions – 5 (7.7%). A number of other sources were given, but there was no trend among the responses.

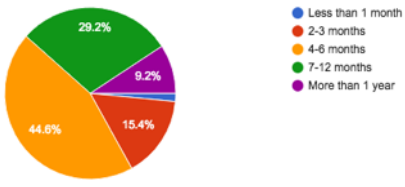
11. How would you prefer to find out about NCRAL conventions? Select all that apply.

65 responses



12. How far in advance do you prefer to learn about NCRAL conventions in order to be able to attend?

65 responses

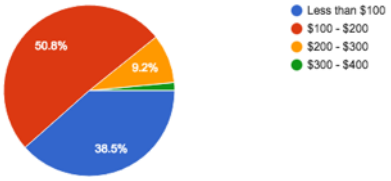


13. What is the maximum distance your are willing to travel to attend a NCRAL convention?

65 responses

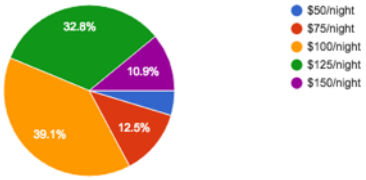
14. What is the maximum amount you are willing to spend on registration fees (not including meals and lodging) to attend a NCRAL convention?

65 responses



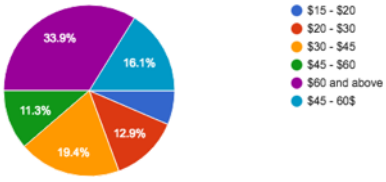
15. What is the maximum amount you are willing to spend on lodging to attend a NCRAL convention?

64 responses



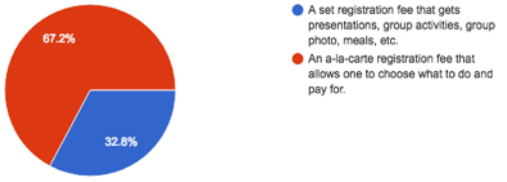
16. What is the maximum amount you are willing to spend on all convention-related meals to attend a NCRAL convention?

62 responses

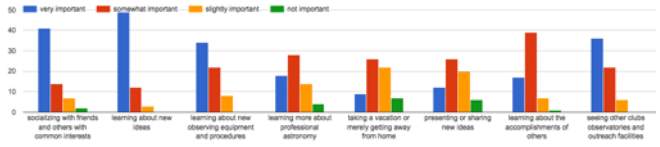


17. What sort of pricing structure would you prefer to see for NCRAL conventions?

64 responses



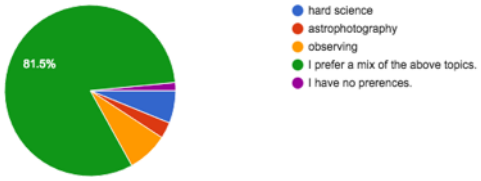
18. How important is each of the follow factors in determining if you will attend a given NCRAL convention?



The following factors were the most important in determining if a member would attend a given NCRAL convention: Response #1, socializing with friends and others with common interests; Response #2, learning about new ideas; Response #3, learning about new observing equipment and procedures; and Response # 8, seeing other clubs' observatories and outreach facilities.

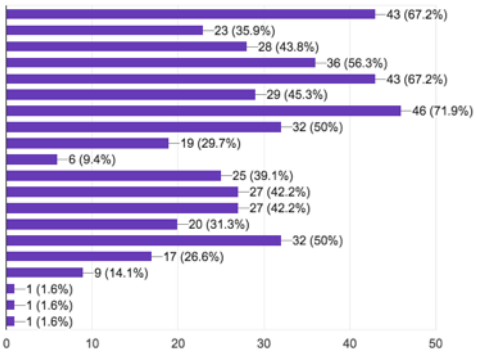
19. What sort of focus would you prefer to see at a given NCRAL convention?

65 responses



20. Which of the following astronomy and astronomy-related topics would entice you to attend a NCRAL convention in the future? Check all that apply.

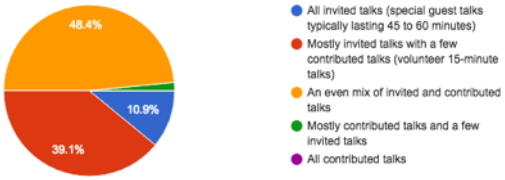
64 responses



The response to the above question were as follows: practical observing – 43 (67.2%); observation basics – 23 (35.9%); astrophotography – 36 (56.3%); planetary observations – 36 (56.3%); deep sky objects – 43 (67.2%); do-it-yourself projects – 29 (45.3%); astronomy – 46 (71.9%); astrophysics – 32 (50%); cosmology – 19 (29.7%); cosmogony – 6 (9.4%); space program – 25 (39.1%); planetary science – 27 (42.2%); Astronomical League observing programs – 27 (42.4%); member education – 20 (31.3%); public outreach – 32 (50%); member recruitment and retention – 17 (26.6%); and starting and operating a successful astronomy club 9 (14.1%). Three additional "other" ideas were suggested with no trends among the suggestions.

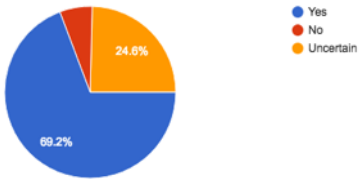
21. Where would you like to see emphasis placed in future NCRAL conventions?

64 responses



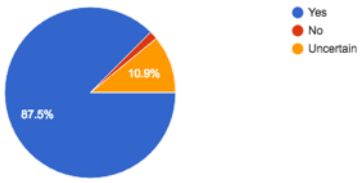
22. Would you like to see whole-group visits to a local planetarium as part of the convention program?

65 responses



23. Would you like to see whole-group visits to a local observatory (amateur or professional) as part of the convention program?

64 responses



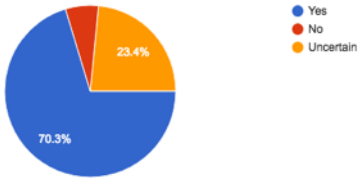
Questions 24 and 25 were incomplete when the survey began in that the directionality of the question (very interested vs. not at all interested) were not indicated. This error was not caught in time despite the fact that one participant did mention it in the comments section. As a result, the first 33 data points were useless. The responses of the latter 32 survey completers were as follows:

Question 24. To what extent would you be interested in "pre-convention" workshops? With 32 responses, the average value was 3.125 where 1 represents "very interested," 3 represents "neutral," and 5 represents "completely disinterested."

Question 25. To what extend would you be interested in "post-convention" workshops? With 32 responses, the average value was 3.273 where 1 represents "very interested," 3 represents "neutral," and 5 represents "completely disinterested."

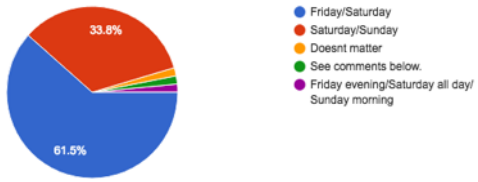
26. Would you like to see those who completed an Astronomical League observing program during the past year recognized in some way?

64 responses



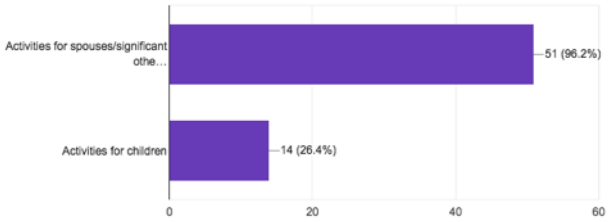
27. Do you prefer Friday/Saturday conventions or would you prefer other days of the week?

65 responses



28. What type of optional event availability would you like to see at or near the convention location for those traveling with you? Check all that apply.

53 responses



Question 29 was a free-response question: What is/are the most important factor(s) in determining if you can/will attend a NCRAL convention? The responses were many and varied. A review of all responses indicates the following major considerations: registration cost, travel distance, speakers and topics, schedule conflicts, and available tours.

Question 30 was also a free-response question: What would it take to get you to attend a NCRAL convention outside of your stated maximum cost and distance? Again, the responses were many and varied. A review of all responses indicates the following major considerations: exceptional program of speakers and topics, duration of program, specialized training/workshops; opportunity for observing,

So, we have learned how to improve conventions; these data have been shared with the host of our next convention – Popular Astronomy Club. They are using these data to the fullest. Expect to see some changes with NCRAL 2019.

NCRAL Chair's Note: Thanks to all who participated in this survey. Your efforts will improve the offerings of the Regions and will, undoubtedly, help to increase attendance at our future conventions – just another benefit of membership!

NCRAL LOGO CONTEST ENTRIES

The Summer 2018 issue of ***Northern Lights*** contained a call for proposals for an NCRAL logo approved by the Regional Council. (https://ncral.wordpress.com/newsletter-archive/.) At that time, the following procedures were set forth to govern the selection process:

Guidelines:

1. We are not currently seeking finished products, merely draft logos.
2. The draft logos need not be design by a member of a NCRAL-affiliated society; anyone is eligible to enter the competition.
3. More than one submission by the same person is permissible.
4. Drawings must be the original work of the competitor; no use of preexisting logos will be permitted; no copycatting of existing logos will be permitted.
5. Both astronomically accurate and stylized logos are acceptable.
6. Draft logos may be submitted at any stage of development so long as they adhere to these guidelines.
7. Drafts may be submitted in either color and/or black & white; submissions should be made only after publication of the Summer 2018 issue of ***Northern Lights.***
8. Drawings must be submitted as high-resolution files (e.g., 250 kB); send as attachment, do NOT embed in the message.
9. All logo drafts must be electronically submitted via email to the Regional Chair at carlwenning@gmail.com. Submissions must include name of author, contact information, club affiliation (if any), statement indicating that the draft logo the original work of the submitter.
10. All submissions will be published in the Fall 2018 issue of ***Northern Lights***; the submission deadline is August 30, 2018.
11. Comments for improvements then will be solicited from the entire NCRAL membership. These comments will be forwarded to the various artists for use in revising the initial draft(s). The Regional officers reserve the right to reject any submission(s) that could be construed as offensive.
12. Revised drafts will appear in the Winter 2019 issue of ***Northern Lights***. Readers will then be asked to vote for the best three logos and offered the opportunity to make further suggestions for revisions. Deadline for submitting revised logo drafts to the Regional Chair is November 30, 2018.
13. The three revised drafts receiving the most votes will be published in the Spring 2019 issue of ***Northern Lights***. No resubmission is necessary.
14. At the NCRAL 2019 convention in Moline, IL, the assembled members of NCRAL will vote on the top final draft. The 3rd place award winner will receive a prize of $25, 2nd place $50, and 1st place $75 plus the benefit of knowing that their draft logo in finished form will be the one to represent NCRAL.
15. Up to $350 will be allocated to render the formal artwork and produce scalable image files. Any trademark becomes the property of NCRAL. NCRAL will use the finished logo in any fashion deemed reasonable by the Executive Officers.

Criteria:

The final draft artwork that is chosen on the basis of the actual NCRAL logo will have the general characteristics:

1. Simple – The simplest logos are those that people will recognize immediately and remember the best.
2. Scalable – The logo should be simple enough to be able to be scaled down or up and still look good.
3. Impactful – The logo should capture the viewer's attention and leave a positive impression; the logo should look good in both color and black & white renditions.
4. Relevant – The logo should be relevant to who we are as NCRAL; it must have a meaning that obviously relates to astronomy.
5. Accurate – The logo should be astronomical accurate to the extent possible.

Six drafts were proposed by four different individuals. They are shown in the sequence submitted on the next page.

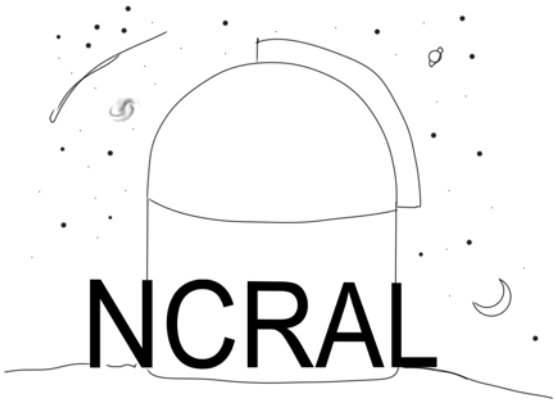
We are now in the second phase of the logo contest outlined above as step 11: Comments for improvements then will be solicited from the entire NCRAL membership. These comments will be forwarded to the various artists for use in revising the initial draft(s).

If you as a member of an NCRAL affiliate wish to share your recommendations for changes, please email them to Assistant Chair John Attewell at john_attewell@hotmail.com. Please indicate the submission number to which your are referring, and how you feel the draft logo might be enhanced. Your recommendations will be provided to the artist anonymously. Recommendations for changes must be received by September 30th at which time recommendations will be forwarded to those who proposed the various designs. The comments then will be acted upon or rejected by the

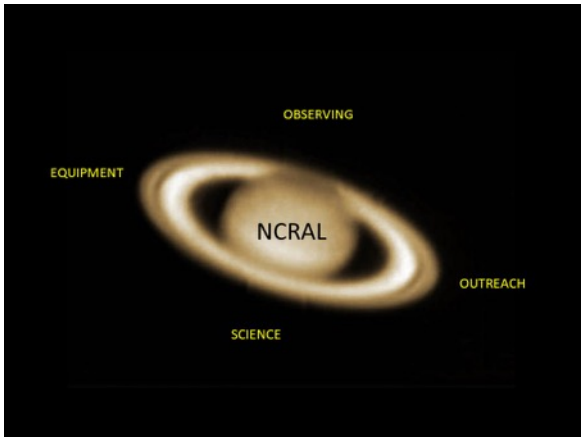
proposing artists. The deadline for submitting revised logo drafts to the Regional Chair is November 30, 2018.

Revised drafts (or original drafts if no changes have been made) will appear in the Winter 2019 issue of ***Northern Lights***. Readers will then be asked to vote for the best three logos and offered the opportunity to make further suggestions for revisions.

The top three draft logos will then be presented at NCRAL 2019 where a single winner will be chosen. A finalized version will then be produced for use by NCRAL.

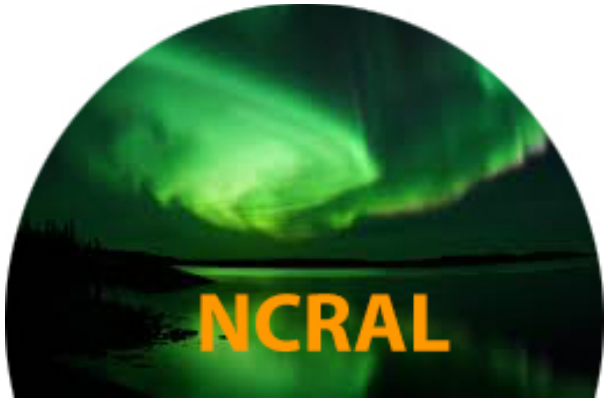


SUBMISSION #1 (ABOVE)



SUBMISSION #2 (ABOVE)

SUBMISSION #3 (ABOVE)



SUBMISSION #4 (ABOVE)

SUBMISSION #5 (ABOVE)

SUBMISSION #6 (ABOVE)

REGIONAL COUNCIL APPROVES TWO MINI-GRANTS

At NCRAL 2018, the membership agreed to the development of two mini-grants for NCRAL affiliates. The first mini-grant is designed to both recruit and retain members of an NCRAL affiliate (Member Recruitment & Retention). The second mini-grant is designed for an NCRAL affiliate to recruit one or more non-affiliates into the Astronomical League (Non-affiliate Recruitment). These mini-grants are seen as incubators for successful activities that can be replicated by other NCRAL affiliates. Each mini-grant is worth up to $250 and normally only one of each type of mini-grant will be conferred annually. Under unusual circumstances, the Executive Officers may increase the size of the awards and the number of mini-grants.

Eligibility: In order to receive a mini-grant, the applying club, society, or association must be an A.L./NCRAL affiliate. In addition, the affiliate's A.L. dues for the following year must be paid at the time the grant's funds are disbursed (e.g., if the mini-grant is conferred in May of one year, the A.L. dues for the following year must already be paid – A.L. dues must be paid by July 1st of each year).

Obligations: The NCRAL affiliate that receives a mini-grant agrees to adhere to all requirements and procedures. The affiliate agrees to prepare – at the end of the funded activity – a written report sufficient to allow other affiliates to replicate successful results. This report must include a detailed description of activities and a summary of expenditures as well as both baseline and post-activity data as indicators of success or failure. This report must be submitted to the NCRAL Chair and the editor-in-chief of the ***Northern Lights*** newsletter in time for publication in the Winter issue of the year immediately following the mini-grant's activities (e.g., mini-grants awarded in May one year must be reported by the end of November the same year.)

Requirements: Mini-grant funds must be expended within six months of the date on which they are awarded (e.g., funds conferred in May of one year must be spent by November of the same year unless an extension is approved in advance by the NCRAL Chair). Funds may not be used to pay salaries, purchase equipment (anything over $100), or provide for travel beyond the cost of gas. Funds may be expended only on contractual (e.g., printing, meals, travel, honoraria, up to 50% dues payment for non-A.L. affiliate, convention registration) and commodity items (e.g., giveaways, consumable supplies).

Procedures: 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: https://goo.gl/WzY1Mt

Deadline: The application deadline for all mini-grants is March 31st of the year in which they will be conferred. The first mini-grants, if approved, will be announced at NCRAL 2019.

Selection: NCRAL Executive Officers (Chair, Vice Chair, Secretary/Treasurer, Representative to the AL) and prior recipients (Presidents of recipient affiliates, if any) will be responsible for reviewing all proposals and determining which proposals will be funded by majority vote. The basis for the decision will focus on the feasibility of activities, likelihood of success, potential impact on the Region, the availability of matching funds, and replicability by other NCRAL affiliates among other factors of significance to the voters.

Announcement: The announcement of successful mini-grant proposals will be made at the annual business meeting of the Region which is normally held in the spring of each year (April or May). Award checks will be forwarded as soon as A.L. dues payment for the following year is confirmed.

CALL FOR NOMINATIONS:

EXECUTIVE OFFICERS – CHAIR, VICE CHAIR, REGIONAL REP TO THE AL, NCRAL REGION AWARD, NCRAL NEWSLETTER EDITOR AWARD

It's never too early to start thinking about the nominations process for next year's **Executive Officer** elections. Assembling a slate of officer candidates last minute can be difficult, if not impossible, as seen at the business meetings at Lanesboro, MN, and Sturgeon Bay, WI. In the first case, only prolonged and repeated calls for nominations resulted in candidates for some offices. In the second case, no nominations were received, and the selection of a new secretary-treasurer was handed off to the Region's Executive Officers.

Also worthy of note is the fact that our last regional chair held the position for 12 years and the last regional secretary-treasurer held the position for 10 years. They did so most graciously because no one was willing to stand for election. Regardless, according to the NCRAL bylaws, no officer should succeed himself/herself more than two times for a maximum serial term of 6 years (chair and vice chair) or 9 years (secretary-treasurer and representative to the Astronomical League). Fortunately, no one is term-limited this coming year, but this does not mean that those currently holding positions will be willing to stand again for election.

According to NCRAL bylaws, in 2019 we must elect both Regional chair and vice-chair to two-year terms. We need to elect a Regional ALCor to a 3-year term. In compliance with the Region's bylaws, the Regional Chair plans to appoint a Nominations Committee in compliance with the Bylaws sometime this autumn. Note the following from the Article V, Section 2, of the Bylaws:

> *The NCRAL Chair shall appoint a nominating committee chair who will not be eligible to stand for election to any NCRAL office. The nominating committee chair shall select, from among the NCRAL membership, one or more candidates for each office to be elected and the committee chair shall issue a report to the NCRAL Chair prior to the Regional business meeting or the lapse of one (1) year following the previous convention. Additional nominations may also be made by any NCRAL member to the committee chair and provision shall be made for nominations from the floor at the Regional Business Meeting of Article VII.*

If you are willing to be serve as a member of this nominations committee, please contact the current Regional Chair directly at carlwenning@gmail.com

In addition, we should also 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 hard 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 both the 2018 and 2019 Region awards. Unfortunately, a call for 2018 nominations was not sent out. In addition, there was one nomination that was carried over from the previous year that should have been considered, but the current leadership did not find out about it until a chance conversation revealed it after NCRAL 2018.

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 special ceremony concluding the dinner banquet, of the next Regional convention, NCRAL 2019, to be held at Moline, IL, Friday/Sunday, May 3-5.

<u>The Rules for nomination are now set as follows:</u>

1. The individual must be a member in good standing, either through an AL/NCRAL-affiliated 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 and the regional representative are the voters and will base their decision on the information provided. Each member votes independently and will use his/her best judgment. All decisions are final.
4. The winner will be contacted not less than 30 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 not selected, will not be revealed.

5. All non-winning nominations will be kept on file for two years after initial submission. After such time, a new nomination needs to be competed.

There are many deserving candidates within NCRAL. It is our hope to have a least one nomination from each society of the Region. We look forward to receiving your nominations by the date of the March equinox. If there are any questions, please contact Vice Chair John Attewell via phone or email using the contact information found on the Submission Form below.

Submission Format for the NCRAL Region Award

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

Shipping Address _____

City _____ State _____ Zip _____

Club Affiliation _____

Nominator's name _____ Club affiliation _____

Address_____ City _____ State _____Zip_____

Phone _____ E-mail _____

Submission Guidelines:

Prepare a statement of the nominee's accomplishments in one or more of the areas listed under criteria. This statement should not exceed 3 double-spaced pages (1,000 words). Length does not necessarily equal strength. The statement should include number of years in office or committee membership and dates of said membership. The statement should also include length of time participating in public education, number of presentations, etc.

Supporting data; please include 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.

NOMINATIONS MUST BE RECEIVED by the date of the March equinox. Any nominations received after this date will be kept on file for 2020. All nominations must be sent via email to John Attewell, NCRAL Vice Chair, at john_attewell@hotmail.com. For additional information you may contact John at Mobile: (507) 398-4492 or Home: (507) 282-3120.

Lastly, let's not forget about the **NCRAL Newsletter Editor Award** which is new this year. It is expected that the inaugural award will be conferred at the NCRAL 2019 meeting. See the lengthy announcement and criteria for this award published in Summer 2018 issue of ***Northern Lights***. Visit https://ncral.wordpress.com/newsletter-archive/

TCAA Guides to Amateur Astronomy Available to NCRAL Affiliates

As mentioned previously at NCRAL 2018 and in ***Northern Lights***, the NCRAL Chair and member of the Twin City Amateur Astronomers, Carl Wenning, is making certain of his publications known as the *TCAA Guides to Amateur Astronomy* available for use by NCRAL affiliates. The Guides may be downloaded and used "as is" from http://tcaa.us/TCAAGuides.aspx or may be adapted with permission from Carl. Permissible adaptations include an NCRAL-affiliate's logo as well as additional prefatory remarks. If you would like to adapt one of Carl's TCAA Guides, then email him for assistance at carlwenning@gmail.com

The *TCAA Guides to Amateur Astronomy* most suitable and available for adaptation are the following according to Carl:

Introduction to Amateur Astronomy (58 pages)
Astronomy as a Hobby (9 pages)
The Art of Sky Interpretation (16 pages)
Buying Binoculars & Telescopes (15 pages)
Optimizing Deep Sky Observations (11 pages)

Update 1

NCRAL 2019 Annual Convention

Presented by the **Popular Astronomy Club**

Astronomical Voyages of Discovery: Past, Present & Future

New and improved . . . added Sunday morning: May 3 – 5, 2019

Convention Location: Stoney Creek Hotel & Conference Center, Moline, IL

Why are we giving you little details as plans progress? Because you need to plan for travel to the convention in advance! In order to maximize the bang for your buck, the current plan is to open registration at 1PM on Friday May 3rd with activities starting at 2 PM and finish by noon on Sunday May 5th.

Should you plan on arriving Thursday evening? If you have nothing else important going on, yes! Although some plans are still a bit fluid, there will be opportunities for pre-convention Riverboat ride, John Deere plant tour, Rock Island Arsenal Museum tour, Botanical Garden visit, Blackhawk State Historic Site visit, and more.

Is Moline a family destination? Pack up the whole family! Think Family Museum, Niabi Zoo, and climbing on John Deere Construction and Agricultural equipment.

How do you know there will be something at the convention that interests you? There are four cornerstones of amateur astronomy that are supported by the Astronomical League: The *Art of Observing*, *Joy of Outreach*, *Coolness of Equipment,* and *Science of Astronomy*. Our goal is to include something for you regardless of why you are into astronomy!

Do you need to wait for the next issue of Northern Lights to learn about updates for the NCRAL 2019 Convention? Absolutely not! Read below on how to be added to our mailing list. We'll let you know when the NCRAL 2019 website is updated!

To be the first to know as plans are finalized, please send your name, club affiliation, and email address to: 2019NCRALInfo@gmail.com

ALCON 2019 - FIRST ANNOUNCEMENT!

Next year, ALCon 2019 (July 25-29) will start at Kennedy Space Center (KSC) in Florida to commemorate the 50th anniversary of the Apollo 11 moon landing. If you plan to attend, get the dates into your schedule now. A leading reason why people don't attend such meetings is schedule conflicts. Don't let this happen to you.

Our time at KSC will be followed by a three-day cruise to the Bahamas during which the actual conference will be held! See the first official announcement shown to the right for details. The number of cruise cabins is limited, so make your reservations soon as this one is likely to fill up quickly.

Your ASTRONOMICAL LEAGUE

Join the Astronomical League to commemorate the 50th anniversary of the first moon landing!

ALCon 2019

Kennedy Space Center and Southern Skies Cruise to the Bahamas

July 25 - 29, 2019

First, tour the **Kennedy Space Center**, the site of the Apollo 11 launch. Then, enjoy a **three-day cruise to the Bahamas** on a ship by Royal Caribbean and see the southern Milky Way of Sagittarius and Scorpius!

- Thursday July 25, after the KSC tour, stay on-shore at a hotel in Port Canaveral (to be arranged).
- You will need a passport valid through January 2020 or later. (Yes, at least six months after the cruise!)
- Royal Caribbean cruise ship leaves Port Canaveral Friday afternoon July 26 and returns Monday morning July 29.
- Cruise cabins are limited. Reservations are being accepted, with a $100 initial down payment. Pricing (based on double occupancy) for the whole weekend cruise including meals is set at $399 per person (PP) for inside cabins, $579 PP for outside cabins, and $589 PP for Balcony cabins. Singles, triples, and quad rates are available upon request with our agent.
- Members of the Astronomical League only: **To reserve your cabin with a $100 deposit, and for additonal cruise details, please contact Marsha at Lin-Mar Travel, 631-736-1049 or marsha@travelwithlin-mar.com.**

More details available shortly.

AL-AFFILIATED CLUBS CAN NOW DIRECTLY UPDATE THEIR INFORMATION ON THE AL WEBSITE!

Did you know that the president, treasurer, or ALCor of your club may update information about your club yourself by requesting an account at URL https://members.astroleague.org/request_account and entering their email address and then pressing the "Request account information" button near the bottom of the page? An email with instructions and a link to create a new account will then be sent within a few minutes. Once logged in, there are instructions at https://members.astroleague.org/content/club-officer-tutorial on how to update your club's info.

Add Your Email Address to the NCRAL Member Database

Add your email address to the NCRAL member database so you can get direct mailings of ***Northern Lights*** and important and timely announcements about Regional conventions, star parties, and so forth. Your email address will never be shared with or sold to outside entities. Only blind addressing (Bcc:) will ever be used with this email list so that others will not see your email address.

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 at-large membership) 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: https://goo.gl/gsS8SF

Following a start-of-September email "blast" as a reminder, our numbers recently have grown. Thus far we just over 300 members have signed up to receive direct communication – only 16% of the approximately 1,850 members in the Region – despite an early September email solicitation that went out to some 1,400 members for whom the Regional Chair has emails.

Yerkes Observatory Petition

On March 7, 2018, the University of Chicago announced the intention to "cease operations" at Yerkes Observatory in Williams Bay, Wisconsin. Their stated deadline of October 1, 2018 gave just 6 months for the concerned staff and community to work with the University on a transition plan which the University admittedly does not have.

A petition has been created calling for a more reasonable approach in dealing with the historic observatory. The petition can be found at the following case-sensitive URL: https://goo.gl/whcRCk

Please consider showing your support with a signature. We feel that doing anything less than giving the time, resources and fairness of a properly planned and executed transition of operations would be an enormous injustice to the monument of history, education, and community that Yerkes Observatory has become.

Future NCRAL Regional Conventions

Each year at NCRAL's annual business meeting, the Region receives offers for hosting upcoming meetings. The following affiliates have agreed to hosting future conventions. We are still in need for additional hosts, but especially for 2022, 2024, and the years beyond. It's never too early to start planning to host.

- 2019 Rock Island, IL: Popular Astronomy Club (confirmed)
- 2020 Port Washington, WI: Northern Cross Science Foundation (confirmed)
- 2021 Green Bay, WI: Neville Public Museum Astronomical Society (confirmed)
- 2022 OPEN
- 2023 Bloomington-Normal, IL: Twin City Amateur Astronomers (confirmed)
- 2024 OPEN

If your club has never hosted an NCRAL Regional convention, please consider doing so. While it is a considerable amount of work, it can be quite rewarding – even fun. It provides an opportunity to showcase 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 draft convention planning guide. The guide was developed by experienced hosts of NCRAL conventions in conjunction with one future host who asked lots of excellent questions. Significant contributions were

made by Alan Sheidler (Popular Astronomy Club) and John Beck (Door Peninsula Astronomical Society). NCRAL Chair Carl Wenning, served as contributor and lead author.

The ***NCRAL Convention Planning Guide*** has three sections. Section 1 deals with the "preliminaries" of what it takes to host a Regional convention. Section 2 deals with programming information. Section 3 deals with budgeting information.

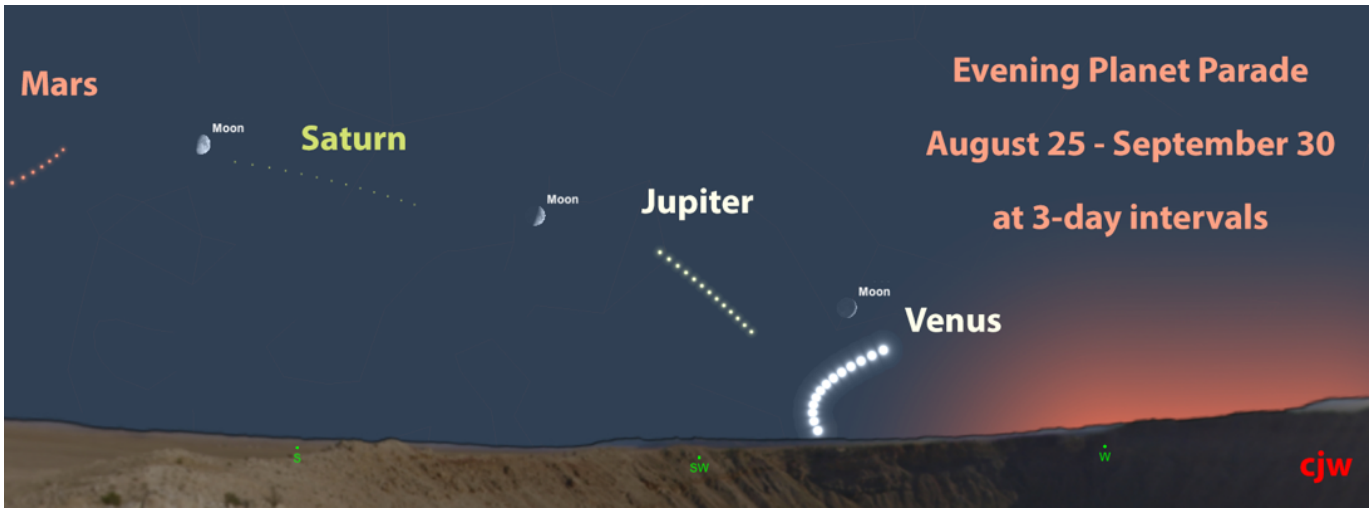
The guide is considered a "living document" that will be updated as new survey information becomes available. The recent NCRAL 2018 post-convention survey was included in the document. Results from the ongoing NCRAL Convention Preferences Survey (see article above) will also be included. The goal is to increase the benefits of convention attendance, thereby increasing attendance at our Region's conventions.

To download and review the planning guide, you may access it through the NCRAL website the following URL: https://ncral.wordpress.com/conventions/. Look for the link at the bottom of the page.

Please contact NCRAL Chair Carl Wenning at carlwenning@gmail.com should you have any questions or wish to toss your hat into the ring.

NCRAL & AL ON FACEBOOK

Did you know that NCRAL now has a Facebook page for sharing information about your Region's AL-affiliated clubs? This is also a great way share observations, notes, images, and any other things you think the NCRAL membership or AL members-at-large living in our region would enjoy. Check us out at: https://www.facebook.com/northcentralregionastronomicalleague/ Here is just one of many graphics that have appeared on NCRAL Facebook recently.



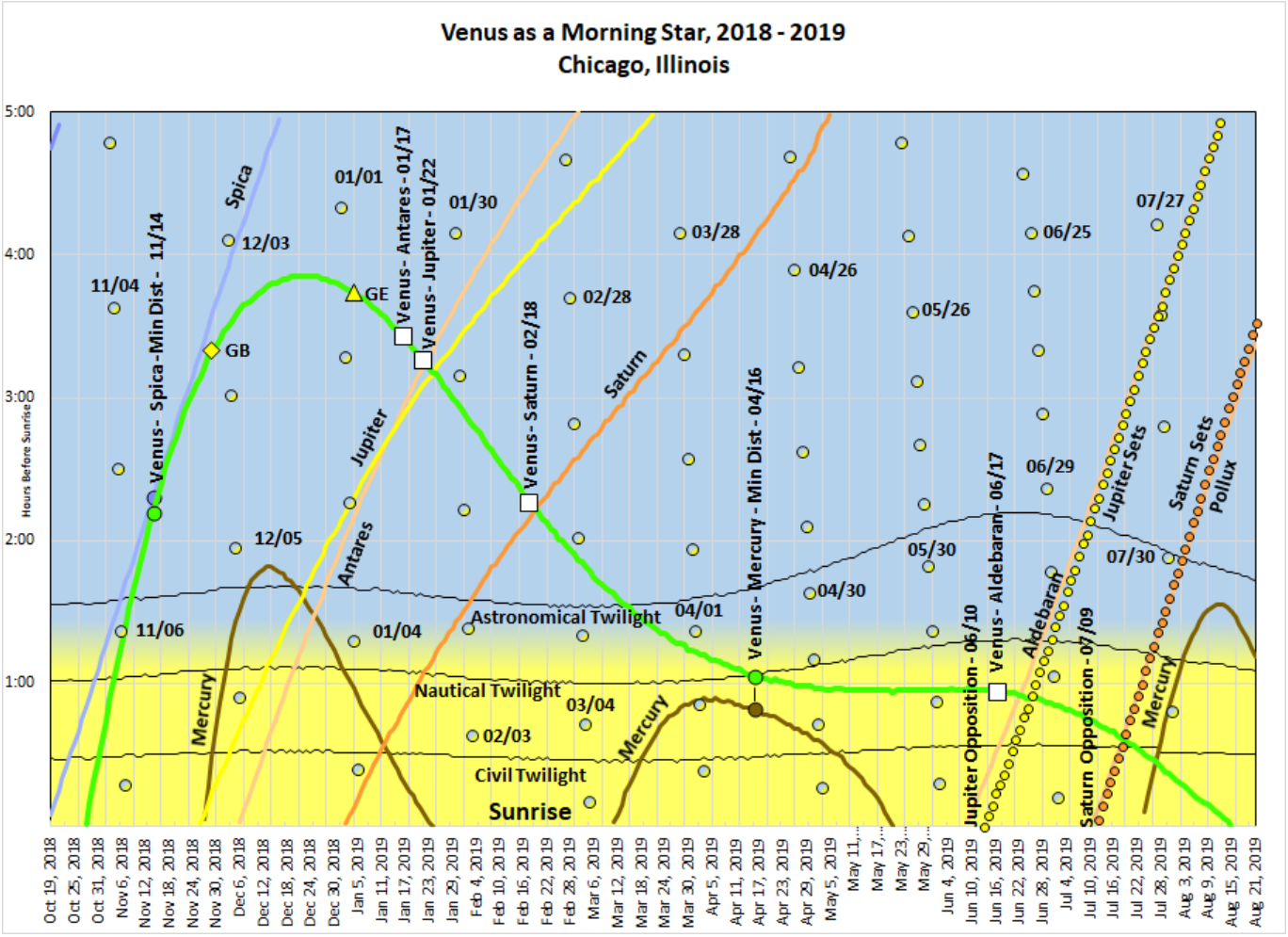
Lastly, would you like to see your images on the NCRAL Facebook page banner? If so, send your image and a 2-3 sentence caption to the ***Northern Lights*** newsletter assistant editor at carlwenning@gmail.com and he will post them on your behalf.

Also, did you also know that the Astronomical League is on Facebook? It's an active site with lots of good information. Check it out at:

https://www.facebook.com/search/top/?q=astronomical%20league

2018-2019: VENUS IN THE MORNING SKY

~ by Jeffrey L. Hunt ~



This chart shows the rising time intervals for Venus compared to sunrise, along with the rising time differences for other bright planets, stars and the moon (circles). The three phases of twilight are graphed: Civil Twilight (sun's altitude is −6°), Nautical Twilight (-12°), and Astronomical Twilight (−18°). The white boxes indicate conjunctions with other stars and planets. Because Venus is the focus of this article, conjunctions are shown on the Venus rising line. The yellow triangle with the letters "GE" indicates Venus' greatest elongation. The greatest brightness is marked with the yellow diamond and the letters "GB." The time intervals for Jupiter setting and Saturn setting are included compared to sunrise. The chart was graphed from data by the U.S. Naval Observatory for Chicago, Illinois.

Venus shines brightly in the morning sky during late 2018 and throughout most of 2019. During this morning apparition, Venus passes Jupiter and Saturn as they head toward their 2019 oppositions. Venus has two conjunctions with each of these outer planets during their apparitions. The first conjunction occurs during this Venusian morning apparition; the second occurs during Venus' next evening appearance as the giant planets head toward their solar conjunctions. In "classic" morning configurations, the moon passes Venus on several mornings.

It is important to note that the times on the chart above and identified in the text are calculated for Chicago, Illinois. When appropriate, time intervals are included so readers can correct the times for their locations. Additionally, the objects on the chart are seen after the time intervals indicated, as the charted times are when they appear at the horizon.

When two lines intersect on the chart, this indicates that two objects rise at the same time. Conjunctions occur at dates near these intersections. If a moon circle appears near a planet or star, they rise nearly at the same time. The closest approach

can be on that date, the day preceding, or the following day. The time intervals for Jupiter setting and Saturn setting, compared to sunrise, are included as well. When these planets set at sunrise, they are at opposition: Jupiter, June 10, 2019; Saturn, July 9, 2019.

Venus' morning apparition begins at its inferior conjunction on October 26, 2018, at 9:16 a.m. CDT. At conjunction, Venus is 6.5° south of the sun. In a clear sky, it could be visible to the unaided eye. Stand under an overhang that blocks the sun to see it. Carefully observe Venus through a telescope, because of its proximity to the sun. Venus displays a very thin crescent that is less than 1% illuminated. The planet is 0.27 Astronomical Units away from Earth and displays a whopping 61" angular size, although this is about 3% of the moon's apparent diameter.

After conjunction, Venus seemingly leaps into the morning sky. It appears to be chasing Spica. In just two weeks after moving between the earth and sun, this brilliant planet rises at the beginning of twilight. The Spica chase continues until mid-November, as Venus approaches its greatest brightness. Venus does not reach Spica, but passes within 1.2° during mid-November, a quasi-conjunction.

After it reaches its greatest brilliance and greatest elongation, Venus has morning conjunctions with Antares, Jupiter and Saturn. Venus begins a slow fade back into the sun's glare reaching its superior conjunction on August 14, 2019, at 1:07 a.m. CDT. Here are the highlights of Venus as a Morning Star:

- **November 4, 2018** (apparent magnitude, −4.3; apparent size, 59.3"; illumination, 3.1%; distance, 0.28 Astronomical Units; rising time interval before sunrise, 60 minutes.) Venus rises at Nautical Twilight (sun's altitude is −12°). At 6 a.m. (30 minutes before sunrise), Venus is 5° up in the east-southeast. Venus is 4.4° below Spica (α Vir, m=0.96); it is about 100 times brighter than the star. The nearly five-magnitude difference is a visual representation of how apparent brightness relates to the magnitude scale. The waning crescent moon (26.2 days old) is 26.8° above Venus.
- **November 6** (−4.4, 58.3", 4.3%, 0.29 AU, 77m), Venus is 3.6° below Spica with the crescent moon (28.3 d) 8.9° to the left of the planet.
- **November 9** (−4.5, 56.4", 6.5%, 0.30 AU, 96m), Venus rises at Astronomical Twilight (sun's altitude is −18°). After today, Venus rises before the beginning of twilight until March 14, 2019. At 5:45 a.m. CST (50 minutes before sunrise) Venus is 9° up in the east-southeast. Venus is closing in on Spica. They are 2.3° apart. Through a telescope, Venus appears as a thin morning crescent phase.
- **November 14** (−4.7, 52.8", 10.7%, 0.32 AU, 132m), Venus and Spica are at their minimum distance. Venus is 1.2° to the lower left of Spica. This is a quasi-conjunction. Venus closes to within 5° of Spica, but Venus neither passes Spica in equatorial coordinates nor ecliptic coordinates, the definition of a quasi-conjunction.
- **November 24** (−4.9, 45.2", 19.9%, 0.37 AU, 182m), Venus is at its greatest brilliancy. On the rising chart above, this is designated by the yellow diamond with the letters "GB," on the mid-point morning (November 29). It is important to note that this is not a singular event, but the duration of this greatest brightness occurs across several mornings. More formally, Venus is near its greatest illuminated extent, defined as a geometrical configuration when Venus has an elongation of 40° – midway between inferior conjunction and greatest elongation. This occurs December 1, when Venus' illuminated portion covers more area of the sky than any other time during its apparition. (For a more technical explanation of greatest illuminated extent, see https://tinyurl.com/venus-greatest-illuminated.) For our description, greatest brilliancy occurs during a 11-day period when Venus displays its greatest visual brightness. Its photometric brightness may slightly change, but our eyes cannot perceive that minute difference.
- **November 26** (−4.9, 43.8", 21.7%, 0.38 AU, 189m), At Nautical Twilight (105 minutes before sunrise), Venus is 20° up in the southeast. Through a telescope Venus is a thicker morning crescent phase than earlier this month. This morning it is 21.7% illuminated. Venus is 4.1° from Spica; the gap grows daily. Jupiter is at its solar conjunction today (12:33 a.m. CST). Watch it emerge from behind the sun into bright twilight.
- **November 29** (−4.9, 42.0", 24.0%, 0.40 AU, 200m), As Venus is at its greatest brightness, notice that it is about the same altitude (16°) as Sirius (α CMa, m = −1.47), in the southwest, at 5:20 a.m. CST (97 minutes before sunrise). While it is not appropriate in formal astronomy to visually compare respective brightness of objects that are widely separated (101° in this case), notice that Venus is distinctly brighter (about 25 times) than Sirius – the brightest planet compared to the brightest star. Venus is now 5.3° to the lower left of Spica, about two weeks after their quasi-

conjunction. The waning gibbous moon (21.8 d) is 61° up in the south and 1.9° to the upper left of Regulus (α Leo, m = 1.3).

- **December 3** (−4.9, 39.3", 27.6%, 0.43 AU, 210m), The gap between Venus and Spica is 7.3°. The waning crescent moon (27.5 d) is 5.6° above Venus.
- **December 10** (−4.8, 35.3", 33.2%, 0.48 AU, 223m), Venus passes 0.5° below Kappa Virginis (κ Vir, m = 4.1). Use binoculars or a small telescope to resolve the pair. Venus is now 11.7° from Spica.
- **December 13** (−4.8, 33.6", 35.6%, 0.50 AU, 227m), This is the date of the earliest Venus rise (3:23 a.m. CST). The separation from Venus to Spica has grown to 13.8°.
- **December 19** (−4.8, 30.9", 39.7%, 0.54 AU, 231m), Today is the greatest time interval between Venus rising and sunrise. While the Venus rising time is still 3:23 a.m. CST (in Chicago), sunrise changed 4 minutes earlier during the past week. The gap between sunrise and Venus rising now decreases, on average, about 1 minute each morning until Venus rises at Astronomical Twilight less than three months from this morning. Venus and Spica are 10.6° apart. This morning Venus is 4.3° above Zubenelgenubi (α Lib, m = 2.8). Through a telescope, Venus has a very thick morning crescent phase that is 40% illuminated. As it approaches its greatest elongation, watch the phase grow to the morning half phase during the next 18 mornings.
- **December 21** (−4.7, 30.2", 40.7%, 0.56 AU, 231m), Venus is over 25° up in the southeast, 45 minutes before sunrise. It is 26° to the upper right of Jupiter. This morning Mercury passes 0.9°to the upper left of Jupiter. Mercury, Jupiter, and Antares (α Sco, m = 1.0) are nearly in a line spanning 6.1°.
- **December 23** (−4.7, 29.3", 42.3%, 0.57 AU, 231m), Jupiter rises at Astronomical Twilight, 27 days after its solar conjunction. At 6:30 a.m. CST (45 minutes before sunrise) Jupiter stands 8° above the southeast horizon and 24.5° to the lower left of Venus. Jupiter is clustered with Mercury (m = −0.4) and Antares. Mercury is 6.1° from Antares. Venus and Jupiter are heading for a widely-spaced conjunction on the morning of January 22.
- **December 24** (−4.7, 28.9", 42.9%, 0.58 AU, 231m), Venus passes between Libra's Zubenelgenubi and Zubeneschamali (β Lib, m = 2.6). Venus is 3.1° from Zubenelgenubi (the southern star). Venus is 24.0° to the upper right of Jupiter.
- **January 2, 2019** (−4.6, 26.1", 47.6%, 0.65 AU, 226m), Venus is 25° up in the southeast, at 6:30 a.m. CST (about 45 minutes before sunrise). It is 17.3° to the upper right of Jupiter. The waning crescent moon (26.2 d) lies in between them. The moon is 11.6° above Antares. Venus is 1° to the lower right of Gamma Librae (γ Lib, m = 3.9). View them with binoculars. At higher powers, the Venusian terminator is slightly curved, indicating a very thick morning crescent phase; the half phase is only days away. Saturn was at conjunction just before midnight (11:50 p.m. CST). During January watch it slowly emerge from the bright glare of the morning sun.
- **January 6** (−4.6, 24.7", 50.4%, 0.68 AU, 222m), Venus reaches its greatest elongation from the sun (47.0°). It is 13.6° above Antares. Jupiter is 14.2° to the lower left of Venus and 5.9° from Antares. Venus and Spica are 35.3° apart. Through a telescope, Venus is nearly the same angular diameter as Mars when it was at its closest last summer (July 31). Venus appears at its morning half phase.
- **January 10** (−4.5, 23.6", 52.4%, 0.70 AU, 217m), Venus passes 2.3° from Graffias (β Sco, m = 2.5), in the head of Scorpius. Venus and Jupiter are 10.9° apart.
- **January 17** (−4.5, 22.0", 55.8%, 0.76 AU, 205m), At 6:15 a.m. CST (60 minutes before sunrise), Brilliant Venus is 20° up in the southeast. Venus passes 7.8° to the upper left of Antares. Look for Messier 4 (M4, NGC6121, m = 5.9, 14' across); the globular cluster is 1.3° to the west of Antares. Bright Jupiter is 5.1° to the lower left of Venus and 7.2° from Antares. Venus is now two times farther from Earth than when we marked its greatest brilliancy, 49 days ago. Through a telescope, Venus' terminator is slightly, but distinctly, convex – indicating a morning gibbous phase.
- **January 22** (−4.4, 20.9", 58.1%, 0.80 AU, 195m), Venus passes to the upper left of Jupiter this morning in a widely-spaced conjunction (2.4°). Venus is 22° up in the southeast at 6:30 a.m. CST (40 minutes before sunrise). Venus passes Jupiter (1.1°) again on November 24, 2019, when they appear in the western evening sky on Venus' next evening apparition. Venus and Jupiter resume their close (epoch) conjunctions with a difficult-to-see grouping on February 11, 2021 (0.4°). An easier-viewed epoch conjunction occurs on April 30, 2022 (0.5°). Both of these close conjunctions occur in the morning sky.
- **January 31** (−4.3, 19.3", 61.9%, 0.86 AU, 176m), The waning crescent moon (25.6 d) appears 2° from Venus with Jupiter 8.5° to the upper right of Venus. At 6:30 a.m. CST (35 minutes before sunrise), Saturn (m = 0.6) stands 7° above the horizon and 18.9° to the lower left of Venus. It is

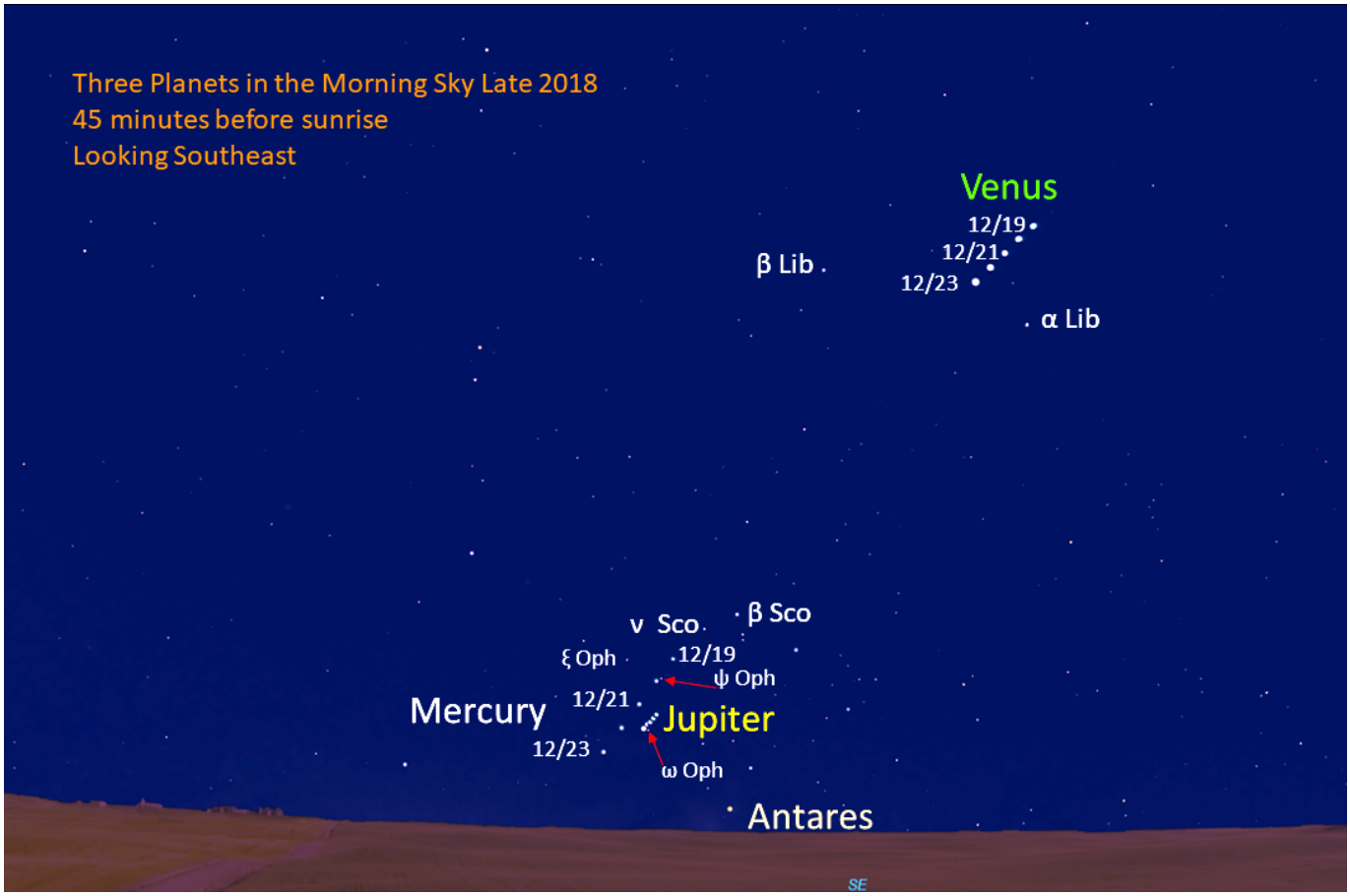
emerging from its solar conjunction on January 1. Watch Venus close in and pass Saturn and separate from Jupiter during February.

- **February 3** (−4.3, 18.8", 63.1%, 0.89 AU, 169m), Through a telescope, Venus is distinctly gibbous, 63.1% illuminated, yet the planet's apparent size is growing smaller each day. Its apparent size has diminished nearly 70% since November 4. Saturn rises at Astronomical Twilight.
- **February 4** (−4.3, 18.6", 63.5%, 0.89 AU, 167m), This is certainly a stretch but look for Venus 1.7° above the Trifid Nebula (M20) and 3.2° above the Lagoon Nebula (M8). The nebulae are about 7.5°above the southeast horizon at Astronomical Twilight. Venus is 12.4° to the lower left of Jupiter.
- **February 10** (−4.2, 17.8", 65.8%, 0.94 AU, 153m), Venus passes 2.2° above Kaus Borealis (λ Sag, m = 2.8), the top of the lid in the Teapot of Sagittarius. The gap between Venus and Jupiter is now 18.2°. Venus has closed the distance to Saturn to 8.6°. Watch the gap diminish during the next week.
- **February 18** (−4.2, 16.8", 68.7%, 1.0 AU, 135m), At 6 a.m. CST (about 40 minutes before sunrise), Saturn is 13° up in the southeast. This morning is the Venus-Saturn conjunction. Venus is 1.1° to the upper left of Saturn. Also look for Pi Sagitarii (π Sag, m = 2.9) 0.3° to the right of Venus. Resolve them with binoculars or a low aperture telescope. As with Jupiter (described on January 22), Venus has another conjunction with Saturn in the evening sky later this year. On December 10, 2019, they appear 1.8° apart. This is followed by a very close conjunction (0.4°) on February 6, 2021 in the morning sky close to sunrise.
- **March 2** (−4.1, 15.5", 72.7%, 1.1 AU, 112m), This morning is another classic Venus-moon pairing with the moon (25.6 d) 4.3° to the right of the brilliant Morning Star. Look for Earthshine on the night portion of the moon. Jupiter (m = −2.0) is 38.9° to the upper right of Venus and Saturn is 13° to the upper right of Venus.
- **March 14** (−4.0, 14.4", 76.3%, 1.2 AU, 93m), Venus rises at Astronomical Twilight and for the rest of this apparition rises earlier during the phases of twilight. Through a telescope, Venus is growing in its morning gibbous phase. This morning, Jupiter is 90° west of the sun. It is 52° to the upper right of Venus. Saturn is 20.8° to Venus' upper right.
- **April 1** (−3.9, 13.1", 81.2%, 1.3 AU, 73m), This is another nice pairing of Venus with the waning crescent moon (26.0 d). The moon is 8.7° to the right of Venus. Mercury (m = 0.9) appears 9.7° to the lower left of Venus. Use binoculars to locate Mercury in the glow of early twilight. Saturn is 47° to the upper right of Venus and Jupiter is 25° beyond Saturn.
- **April 15** (−3.9, 12.3", 84.7%, 1.4 AU, 64m), Venus rises at Nautical Twilight, about an hour before sunrise.
- **April 16** (−3.9, 12.2", 84.9%, 1.4 AU, 63m), Venus and Mercury (m = 0.2) have a quasi-conjunction (4.3°). (See the definition in the November 14 note.) Mercury has a wide greatest elongation (27.7°), but the ecliptic is at a low angle for viewing. Even with its earliest rising on April 3, Mercury rose 8 minutes before Nautical Twilight, about 65 minutes before sunrise. You'll need binoculars to see it in the east-northeast sky. This morning, Mercury rises 15 minutes after Nautical Twilight.
- **April 22** (−3.9, 11.9", 86.3%, 1.4 AU, 61m), Venus rises directly east this morning, about an hour before sunrise; Venus' rising azimuth equals 90°.
- **May 2** (−3.8, 11.5", 88.4%, 1.4 AU, 58m), The waning crescent moon (27.1 d) is 4.3° to the lower right of Venus. Mercury (m = −0.4) is 8.5° to the lower left of Venus, just above the horizon. The time interval between Astronomical Twilight and sunrise grows 24 minutes from this morning through mid-June. While Venus is rising at the same time interval before sunrise for the next month, it appears in a brighter sky. Note this on the rising chart.
- **June 1** (−3.8, 10.5", 93.9%, 1.6 AU, 57m), Venus and the waning crescent moon (27.5 d) are 6° apart with the moon to the planet's lower right. Their altitude is about 7° at 5 a.m. CDT (20 minutes before sunrise). Use binoculars to locate the thin lunar crescent.
- **June 17** (−3.8, 10.1", 96.2%, 1.6 AU, 56m), Venus passes 4.7° to the upper left of Aldebaran (m = 0.8). This will test your observing skills with a telescope. Venus is in a slow slide into the sun's glare, rising, on average, about 1.7 minutes later each day.
- **July 1** (−3.9, 9.9", 97.8%, 1.7 AU, 51m), At 4:55 a.m. CDT (26 minutes before sunrise), a very thin crescent moon (28.0 d) stands 6.3° to the right of Venus. The planet is 3.6° off the east-northeast horizon, another challenge for your observing location and your observing skills.
- **July 21** (−3.9, 9.7", 99.3%, 1.7 AU, 34m), Clearly rising in bright twilight, Venus rises farthest north, azimuth equals 57°, the same position the sun rose at the summer solstice. Tomorrow, Venus rises at Civil Twilight (sun's altitude is −6°), about 30 minutes before sunrise.
- **August 14**, Venus is at superior conjunction, 1:07 a.m. CDT.

With this morning activity, take a look at Venus as it dazzles the eye. A view through a telescope will reveal its rapidly changing apparent size and phase. Watch Venus approach and pass planets and stars along the ecliptic. Marvel at the moon's pairings with this brilliant morning planet.

DECEMBER'S MORNING PLANET BALLET

~ by Jeffrey L. Hunt ~



This diagram shows a time-lapse view of Mercury, Venus, and Jupiter for five days during December 2018 when Mercury passes Jupiter. The chart is made at 45 minutes before sunrise. Individual charts are from Starry Night Pro.

Three bright planets appear low in the southeast sky during late December. Watch their movement during the five days highlighted to see them move in a celestial dance against the starry background, especially with Mercury passing Jupiter. Both planets are among fourth and fifth magnitude stars in southern Ophiuchus. Mercury reaches greatest elongation (21°) on December 15, rising 108 minutes before sunrise. It stands about 20° above the horizon at sunrise. After its greatest elongation, Mercury rises about 2 minutes later each morning. While the planets are moving eastward compared to the stars, Mercury appears lower each morning when viewed at the same time, as it heads back into bright twilight toward its solar conjunction. This morning elongation of Mercury bookends the year, nearly matching rising intervals during its apparition in January. Mercury moves fastest. Watch it as it moves past Psi Ophiuchi and onward toward Jupiter for a conjunction on December 21. Venus, above the Claws of the Scorpion (Zubenelgenubi and Zubeneschamali), rises 231 minutes before sunrise. It moves closer to the Southern Claw during the mornings described below. A few weeks ago, Venus was at its phase of greatest brilliancy and greatest illuminated extent. It appears about 25° above Jupiter and Mercury. In comparison, Jupiter, rising 91 minutes before sunrise, creeps against the sidereal scene. It is near Omega Ophiuchi. Use binoculars to track the motion of the planets against

the positions of the stars and to initially locate Antares which is very low in the sky. The motion of Venus and Jupiter are described in detail in accompanying articles. The following describes the mornings at 45 minutes before sunrise:

- **December 19**: Brilliant Venus (m = −4.7) is 28° up in the southeast, 4.3° above Zubenelgenubi (α Lib, m = 2.8). Bright Jupiter (m = −1.8) is 27° to the lower left of Venus. Jupiter is 0.8° to upper right of Omega Ophiuchi (ω Oph, m = 4.4) and 5.3° to the upper left of Antares (α Sco, m = 1.0), although the star is only 3° in altitude. Use binoculars to find it. Mercury (m = −0.5) is 2.5° to the upper right of Jupiter and 1° to the upper right of Psi Ophiuchi (ψ Oph, m = 4.5).
- **December 20**: This morning Jupiter is 1.6° below Mercury and 0.6° to the upper right of Omega Ophiuchi. Mercury is 0.6° to the lower left of Psi Ophiuchi.
- **December 21**: Mercury, Jupiter and Antares are nearly in a line, spanning 6.1°; the Jupiter-to-Antares gap is 5.2°. Jupiter is 0.9° to the lower right of Mercury, their closest separation, and 0.4° to the upper left of Omega Ophiuchi.
- **December 22**: Jupiter is 1.2° to the right of Mercury (m = −0.4) and 0.2° to the upper left of Omega Ophiuchi.
- **December 23**: Jupiter is 2° to the upper right of Mercury, which has an altitude of 5°. The giant planet is 0.22° to the upper left of Omega Ophiuchi. It passes 5.2° to the upper left of Antares and Mercury passes 6.1° to the upper left of the star. Venus is nearly 25° to the upper right of Jupiter and 2.9° to the upper left of Zubenelgenubi.

Jupiter-Antares conjunctions become more difficult to see at the time of their next two conjunctions. On December 4, 2030, Jupiter is only 6.5° west of the sun when it passes 5.1° from Antares. At the November 23, 2042, conjunction, Jupiter is 8.8° east of the sun, setting 30 minutes after the sun, and passes 5.1° north of Antares. Mercury passes between them on November 20. The November 8, 2054, conjunction occurs when Jupiter sets 75 minutes after the sun. It is 24° east of the sun and 5.1° above Antares. The next conjunction that has the pair perfectly-placed in the evening sky is July 13, 2090, when they are on the meridian at 10:00 p.m. CDT, Jupiter is 5.2° north of Antares.

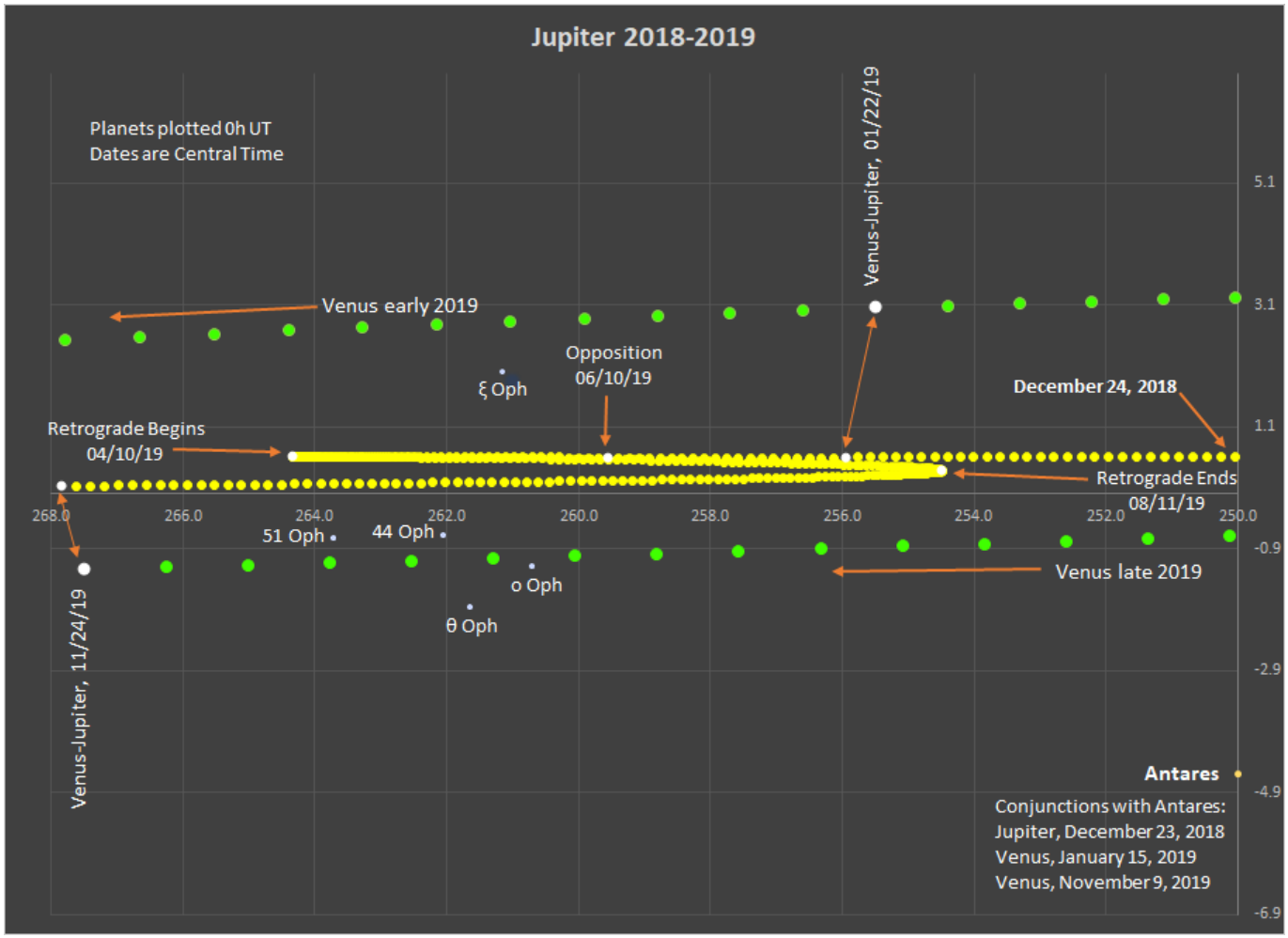
Back to the current apparition of Jupiter: After the Jupiter-Mercury activity, Venus moves between the Scorpion's claws, heading for a widely-spaced conjunction with the giant planet in January. This is followed by a conjunction with Saturn in February. More details are in the accompanying articles; look for a focused article about the Venus conjunctions in the Winter issue.

ANOTHER RECENT FACEBOOK POST – SEE WHAT YOU'RE MISSING?

The above image is just another example of what you are missing if you are not viewing NCRAL Facebook. This post and an associated article were made on August 25th. It was viewed by over 4,100 individuals within the course of the next two days! In addition to NCRAL generated graphics, we are now sharing regular posts from the Astronomical League. Among AL offerings are sky maps showing were to look for various object with eyes, binoculars, and telescopes, and monthly sky maps in both English and Spanish. What great public outreach and educational resource materials for our members. AL and NCRAL Facebook are just two more of the many growing benefits of membership in the Astronomical League and the Region.

2018-2019: Jupiter Dances with the Snake Handler: Conjunction to Retrograde

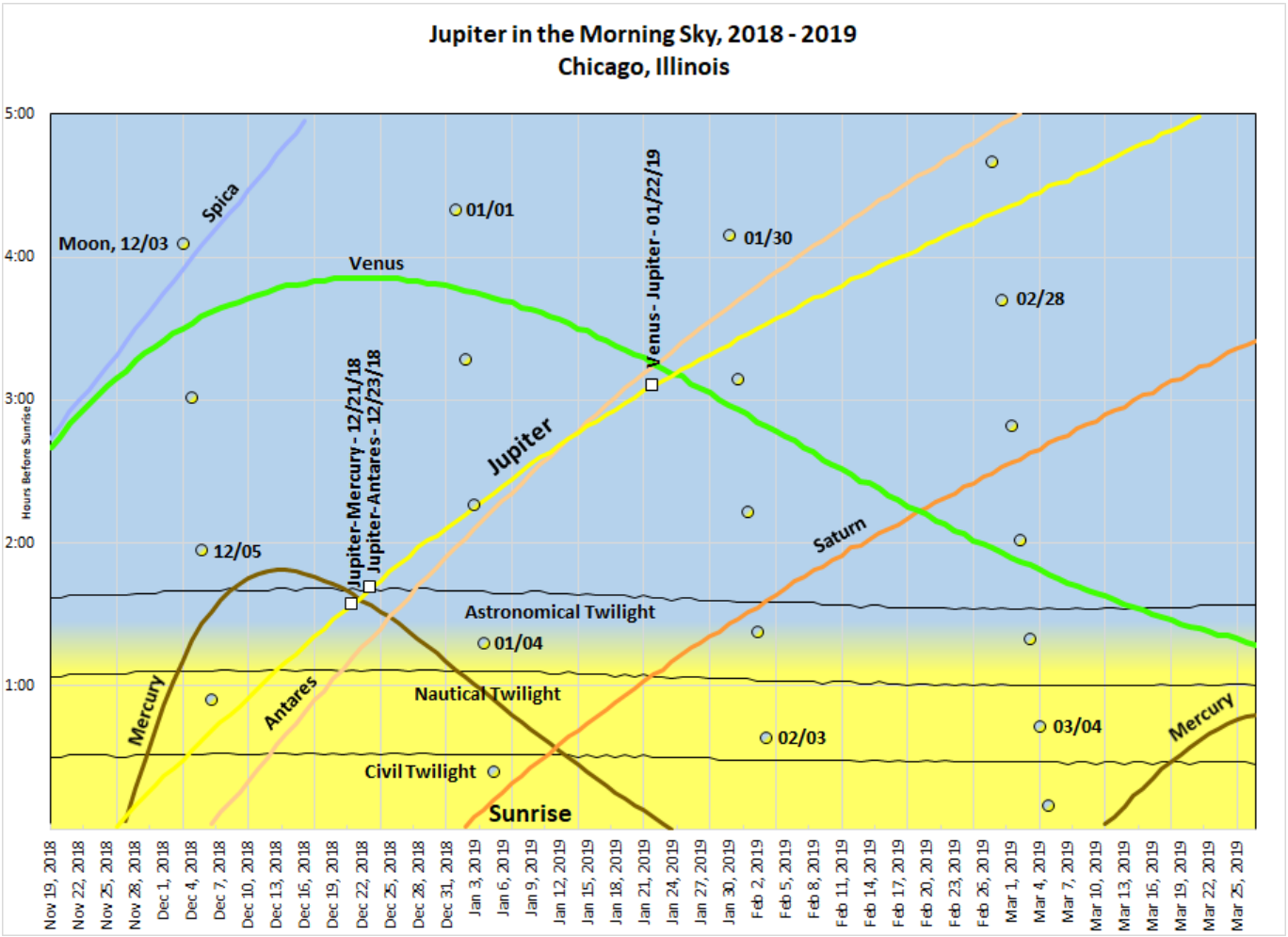
~ by Jeffrey L. Hunt ~



This chart shows the apparition of Jupiter from December 24, 2018 through November 24, 2019. Part of the morning apparition of Venus (January 17, 2019 through February 4, 2019) and a segment of the Venusian evening apparition (November 10, 2019 through November 24, 2019) are included. Planets are plotted at 0h UT. Dates of conjunctions are identified for Central Time. Data are from the U.S. Naval Observatory.

Dr. Jeffrey L. Hunt

About the Author: *Jeffrey Hunt has had a life-long interest in astronomy and astronomy education. He has taught astronomy at all levels from preschool students to university courses. Jeff is a former director of the Waubonsie Valley High School Planetarium in Aurora, Illinois. Dr. Hunt holds several degrees including a master's degree in planetarium education from Michigan State University. He writes an astronomy blog (jeffreylhunt.wordpress.com) showing easily-seen sky events. Currently he is retired with his wife and cat in Northern Illinois.*



This chart shows the rising time interval of Jupiter compared to sunrise until Jupiter rises 5 hours before sunrise. When two lines cross, the objects rise at the same time. The moon's rising times are displayed with circles. Conjunctions are marked on the Jupiter rising line with white boxes. This chart was made with data for Chicago, Illinois, from the U.S. Naval Observatory.

During its 2018-2019 apparition, Jupiter appears among the southern stars of Ophiuchus, the Snake Handler. Just one apparition before its Great Conjunction with Saturn, Jupiter has two conjunctions with Venus. (For more details about the morning apparition of Venus, see the companion article about it. We will highlight Saturn's 2019 appearance in the Winter issue.) Jupiter moves through southern Ophiuchus with third, fourth and fifth magnitude stars. Its passage is worth noting in a dark sky or with binoculars. Here are the highlights from beginning early in its apparition until it begins to retrograde:

Jupiter – Conjunction to Retrograde

As Jupiter emerges into the morning sky from its solar conjunction, it is grouped with Mercury and Antares. Mercury passes Jupiter on December 21. Brilliant Venus is far to the upper right of the grouping and closes the gap early during Jupiter's apparition.

- **November 26, 2018**: Jupiter is at its solar conjunction, 12:33 a.m. CST when it is 0.7° north of the sun.
- **December 3**: Jupiter (m = −1.7) climbs into the morning sky, when it rises at Civil Twilight, 31 minutes before sunrise. (The sun's altitude is −6°.) Watch it appear higher the sky each morning and each week at the same time.

- **December 13**: Jupiter rises in the east-southeast at Nautical Twilight, about 65 minutes before sunrise. (The sun's altitude is −12°.) At Civil Twilight, Jupiter is only 5° up in the east-southeast.
- **December 19**: Jupiter is 0.8° to upper right of Omega Ophiuchi (ω Oph, m = 4.4) and 5.3° to the upper left of Antares (α Sco, m = 1.0), although the star is only 3° in altitude. Use binoculars to find it. Mercury (m = −0.5) is 2.5° to the upper right of Jupiter and 1° to the upper right of Psi Ophiuchi (ψ Oph, m = 4.5).
- **December 20:** At 45 minutes before sunrise, Jupiter (m = −1.8) is nearly 7° up in the southeast. The planet is 5.2° to the upper left of Antares (α Sco, m=1.1). Mercury (m = −0.5) is 1.6° to Jupiter's upper right.
- **December 21:** Jupiter and Mercury are 0.9° apart this morning. Jupiter is 0.6° to the upper left of Omega Ophiuchi. Mercury, Jupiter, and Antares are nearly in a line spanning 6.1°. Today marks two years until the Great Conjunction of Jupiter and Saturn, when they appear 0.1° apart!
- **December 22:** At 45 minutes before sunrise, Mercury (m = −0.4) is 1.2° to the left of Jupiter. Jupiter is 25.2° to the lower left of brilliant Venus this morning. Watch Venus close the gap during the next month.
- **December 23:** Jupiter rises at Astronomical Twilight, 101 minutes before sunrise. (The sun's altitude is −18°.) This morning, Jupiter (m = −1.8) passes 5.2° above Antares. The giant planet appears 0.22° to the upper left of Omega Ophiuchi. Use binoculars or a small aperture telescope to resolve the pair. The Jupiter-Mercury gap has grown to 2°. Mercury is to the lower left of Jupiter.
- **December 24**: The Jupiter-Mercury gap is 3.1°. Mercury is 6.5° from Antares. Venus, appearing 24° above Jupiter moves between Zubenelgenubi and Zubeneschamali.
- **December 29**: The Venus-Jupiter gap is 20.3°.
- **January 1, 2019:** At the beginning of the new year, look for a wide grouping of the crescent moon, two planets, and a bright star. At 45 minutes before sunrise, the waning crescent moon (25.2 d, 19%) is 29° up in the south-southeast, slightly below a virtual line that connects Zubenelgenubi (α Lib, m=2.8) and Zubeneschamali (β Lib, m=2.6). Venus is 4.7° to the lower left of the moon. Jupiter, 11° up in the southeast, is 18° to the lower left of Venus. Antares is 5.5° to the lower right of Jupiter.
- **January 2:** The waning crescent moon (26.2 d, 13%) is 10.1° to the upper right of Jupiter between this giant planet and Venus.
- **January 3**: The waning crescent moon (27.2 d, 7%) is 3.5° to the left of Jupiter.

Venus-Jupiter Conjunction

Early in the new year, brilliant Venus and Jupiter approach a morning conjunction. Venus rapidly moves eastward among the stars, about a degree a day compared to Jupiter. They are heading for a widely-spaced conjunction on January 22. Watch the Venus-Jupiter gap close: January 5, 15°; January 11, 10.1°; January 17, 5.1°.

- **January 22**: At mid-twilight, 40 minutes before sunrise, the Venus-Jupiter pair appears 22° up in the southeast. Venus is 2.4° to the upper left of Jupiter in this widely-space conjunction. Watch Venus move away from Jupiter on the mornings that follow.
- **January 27**: The Venus-Jupiter gap grows to 5.1°.
- **January 30**: About 45 minutes before sunrise, look in the southeast for Venus and Jupiter. Venus (m = −4.3) is 7.7° to the lower left of Jupiter (m = −1.9). The waning crescent moon (24.5 d, 18%) is 6.1° to the upper right of Jupiter.
- **January 31**: The Venus-Jupiter gap is 8.5°, with Venus to the lower left of Jupiter. The waning crescent moon (25.5, 19%) is 6.7° to the lower left of Jupiter and 2° to the right of Venus.
- **February 1**: Jupiter rises about 3.5 hours before the sun on this date. At an hour before sunrise, Jupiter is 19° up in the southeast sky. Look 9.3° to the right of Jupiter for Antares. As dawn approaches, the waning crescent moon (26.5 d, 12%) is 18.5° to the lower left of Jupiter. Look about 10° to the lower left of the moon for Saturn emerging from the sun's glare.
- **February 2**: The Venus-Jupiter gap continues to grow, 10.5° this morning, widening to 15.3° on February 12.
- **February 3**: Saturn rises at Astronomical Twilight. At 60 minutes before sunrise, Jupiter is 27° to the upper right of Saturn with Venus 11° to the lower left of Jupiter. Use binoculars to locate Saturn low in the southeast, about 4° up in the sky.

- **February 19**: At the beginning of twilight, about 90 minutes before sunrise, Jupiter is 14° up in the southeast. During the next several mornings watch Jupiter pass through a dim star field. Use binoculars to note its movement. This morning Jupiter passes 2.6° north of Omicron Ophiuchi (o Oph, m=5.1).
- **February 23**: Jupiter passes 2.4° south of Xi Ophiuchi (ξ Oph, m=4.4).
- **February 26**: Jupiter passes 2.5° above Theta Ophiuchi (θ Oph, m=3.2). The Last Quarter Moon (21.6 d, 52%) is 13.5° to the upper right of Jupiter (m = −2.0).
- **February 27**: The waning crescent moon (22.6 d, 41%) is 2° above Jupiter. Note that the moon is 1.3° to the right of Xi Ophiuchi, one of the stars in the dimmer starfield that Jupiter is moving through during this apparition.
- **February 28**: The thinning waning crescent moon (23.6 d, 32%) is 11.4° to the left of Jupiter.
- **March 1**: Jupiter rises 4.5 hours before sunrise. At Astronomical Twilight, 90 minutes before sunrise, Jupiter is 24° up in the south-southeast. The Venus-Jupiter gap is 38° with the waning crescent moon (24.9, 22%) and Saturn in between. Saturn is 3° to the left of the moon.
- **March 6**: Jupiter passes 1.6° north of 44 Ophiuchi (44 Oph, m = 4.2).
- **March 13**: Jupiter (m = −2.1) is 90° west of the sun; it rises 4.75 hours before the sun. At the beginning of twilight, it is 23° up in the south-southeast.
- **March 20**: Jupiter passes 1.3° north of 51 Ophiuchi (51 Oph, m = 4.8).
- **March 26**: The waning gibbous moon (19.8 d, 68%) is 8.6° to the upper right of Jupiter (m = −2.2).
- **March 27**: The nearly last quarter moon (20.8 d, 59%) is 4.3° to the left of Jupiter.

Jupiter begins to retrograde on April 10. As of April 1, Jupiter is 25° up in the south-southeast one hour before sunrise. Jupiter is 25° to the upper right of Saturn and 15° to the left of Antares. Here is where we end this chronicle of Jupiter's early apparition. We'll continue this in the Spring issue.

Regional Officer & Leader Contact Information

Chair: Carl Wenning (2-year term expires spring 2019, in first term)

Bio: Carl has been an amateur astronomer since being introduced to the sky by his grandfather during July 1957. Today he is an AL Master observer. He has been a member of the Twin City Astronomers of Bloomington-Normal (Illinois) since 1979. He serves as the club's secretary, historian, and editor of the club's newsletter ***The OBSERVER*** for which he received the AL's 2017 Mabel Sterns Newsletter Editor Award. Carl is a former planetarium director and physics teacher educator who remains actively involved in education and public outreach events.

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Vice Chair: John Attewell (2-year term expires spring 2019, in first term)

Bio: John is a statistical analyst by day and amateur astronomer by night. He is particularly interested in the history of astronomy, especially how early astronomers used mathematics to explain their observations. John is a member of the Rochester Astronomy Club (Minnesota) and was the planning chairman for the 2017 NCRAL convention held at the Eagle Bluff campus near Lanesboro, MN.

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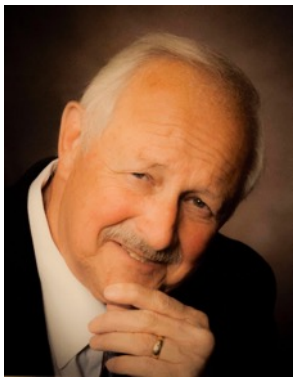
Secretary-Treasurer: Roy Gustafson (2-year term expires spring 2020, in first term)



Bio: Roy 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 last year the Total Solar Eclipse. Roy also taught astronomy at Black Hawk Junior College in Moline, IL. Roy retired from John Deere & Company after 32 years of service.

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Representative: Bill Davidson (3-year term expires spring 2019, completing unfinished term)

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 newsletter *RochesterSkies.*

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NCRAL 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.

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***Northern Lights* Editor-in-Chief:** Jim Gibbs (appointed)

Bio: Jim has been observing the starry skies since he was 10 years old and on and off ever since. His primary affiliation is with the Twin City Amateur Astronomers (Illinois) where he has been a member for 5 years. He is also a member of the Fox Valley Astronomical Society where he has been a member for 5 years. He is also a member of the Fox Valley Astronomical Society where he has held several leadership positions. He is an avid amateur astronomer who enjoys observing and especially imaging around the TCAA dark sites and travelling around finding other dark sites. He is a software engineer and currently is concentrating in growing his small consulting business.

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NCRAL BYLAWS AVAILABLE ONLINE

Did you know that NCRAL has a set of Bylaws? The Region's Bylaws explain who we are, what we are about, and even include a bit of history. For instance, did you know that NCRAL was established on August 30, 1947? Did you know that NCRAL is to be governed by an Executive Council consisting of the Region's three elected officials (Chair, Vice Chair, Secretary-Treasurer) in concert with the Representative to the AL Council? Did you know that there is an NCRAL Council that guides the Region in concert with the presidents and one representative of all the AL-affiliated astronomy clubs in a six-state region? If you'd like to know more about how NCRAL operates, be sure to check out the Bylaws at https://ncral.wordpress.com/bylaws/

NCRAL WEBSITE

~ by Jeff Setzer ~

Did you know that NCRAL has its own website? It's true! Point your browser to ncral.wordpress.com and you'll see a central repository for information about our Region and constituent clubs, as well as back issues of ***Northern Lights***.

As Webmaster, I maintain the information on the website, but the original idea was — and still is — to publish contributions from members. As part of that mission, we will be hosting the emailed newsletters at the website, so people can easily access back issues.

Will the website progress from an occasionally used reference to something more? That's entirely up to you, dear reader. If you have ideas or submissions, contact me at astrosetz@hotmail.com