



**Door Peninsula
Astronomical Society**

DOOR PENINSULA ASTRONOMICAL SOCIETY TO HOST NCRAL 2018



Door Peninsula Astronomical Society is moving ahead with great enthusiasm planning for NCRAL 2018. According to Gary Henkelmann, president of DPAS, "Our committee, headed up by Jacque Axland, has been meeting regularly and has selected the dates of May 4-5, 2018. The venue is the Lodge at Leathem Smith (Sturgeon Bay, WI). This is good program site; they have a banquet facility. (The Lodge is a popular wedding site that we locked-in early, and is only a mile from the DPAS astronomy campus). Special NCRAL room rates are available for the block of rooms set aside for the event.

"We are celebrating the news this month that Newport State Park in northern Door County has achieved the long-awaited designation from the IDA as an International Dark Sky Site (articles in the Milwaukee Journal Sentinel, Green Bay Press Gazette, Door

IN THIS EDITION:

- DOOR PENINSULA ASTRONOMICAL SOCIETY TO Host NCRAL 2018
- NCRAL CHAIR'S MESSAGE
- *NORTHERN LIGHTS* EDITOR MESSAGE
- MINUTES OF THE NCRAL 2017 CONVENTION
- REGIONAL OFFICERS & LEADER CONTACT INFORMATION
- NCRAL ADVISORY GROUP
- ALCON 2018 Coming July 11-14
- Report From the NCRAL 2017 Meeting
- Images from NCRAL 2017, Lanesboro, MN, Rochester Astronomy Club Host
- AstroBits – News Items from Around the Region
- 2017 NCRAL Award Winner
- Go outside. Look up. Fall in love.
- Planet X is Found!
- Getting Ready for the August Total Solar Eclipse: Direct Viewing Methods
- Driftless Dark Skies: Summer of Saturn
- Solar Eclipse August 21, 2017
- Observatory Equipment for Sale
- Bright Planets in June
- Challenger Learning Center of Central Illinois Publishes Eclipse Guide
- NCRAL Starry Skies' Photo Gallery

County Advocate, and Peninsula Pulse), the first in Wisconsin and only 13th in the US. The theme of our 2018 conference will highlight this accomplishment.

"Jacque and her committee have been meeting on conference calls with John Attewell (Rochester Astronomy Club, RAC) and will be incorporating some of the format and procedures employed by the RAC in putting on their wonderful convention, including on-line registration.

"Further information will be available as it materializes, and we will keep you posted. Our website at www.doorastronomy.org can be referenced for updates, and our monthly newsletter, the *Blue Moon Observer*, edited by Dr. John Beck, can also be viewed on the website. We will also provide ongoing updates through the NCRAL newsletter as well."

Gary Henkelmann
DPAS President

NCRAL Chair's Message

NCRAL 2017 has come and gone. One of the after-effects is great memories from a wonderful time. Our hosts – the members of the Rochester Astronomy Club – are to be congratulated on a job exceptionally well done. Of note are the efforts of John Attewell who led the endeavor. The outcome was phenomenal, even though they agreed to host this meeting only after the conclusion of NCRAL 2016 in Normal, IL, last spring. Shortly after returning from Lanesboro, MN, I set to work writing a review of the events that took place there. You will find that article further on in this issue of **NORTHERN LIGHTS**.



Another of the after-effects is that the Region has some new officers. At the NCRAL 2017 meeting, a new Chair, Vice Chair, and Region Representative to the National Council were elected while our Secretary-Treasurer continues in his position. Shown in the image to the left are (from left to right) the following: Donald Klemt (Secretary-Treasurer, Racine Astronomical Society), Carl Wenning (Chair, Twin City Amateur Astronomers), Bill Davidson, (Region Representative to the National Council, Rochester Astronomy Club), and John Attewell (Vice Chair, Rochester Astronomy Club). Congratulations to our new and continuing office holders.

Of course, we are also losing two tried and true officers who have faithfully and ably served the Region over many years – Chair Gerry Kochen and Vice Chair Charlotte DuPree. They posed for a parting shot the day they

stepped down from their long-held positions. I want to express my thanks and the thanks of the Region's members for the sometimes-thankless work that they did. Leadership is always a lonely position, and these two valiant spirits came through magnificently over the years. I'm sure that I and the other officers will be contacting them from time to time for their sage advice. I look forward to seeing them both at future Region meetings.



I'm happy to report that Jeff Setzer (Northern Cross Science Foundation) will continue as webmaster. He has been working with me recently to increase the value of the website. Only recently, for instance, have we posted the Region's Bylaws and updated information about the 2017 NCRAL Award recipient Dave Leake (Champaign-Urbana Astronomical Society.) Check out these changes at <http://ncral.wordpress.com/>.

Assistant newsletter editor Jim Gibbs (Twin City Amateur Astronomers) has agreed to take over the leadership of the **NORTHERN LIGHTS** newsletter. I have appointed him Editor-in-Chief, and I will continue working with him as his assistant – primarily sending him articles and other interesting tidbits for the membership. I hope that other among our membership will support this publication in growing numbers. It would be nice if we could rival the size and quality of the AL's **Reflector** newsletter.

I am now looking ahead to the future. Even before I got out the door at Eagle Bluff Environmental Learning Center in Lanesboro, MN, I received the question, "So, what do you have planned for the coming years?" That's a good question, and one to which I have given considerable thought. My immediate answer was to "grow our Region's membership in the AL, and increase participation at Regional meetings." Of course, we all know that it will take more than that to have a successful Region. After thinking about this question long and hard, here are some things that I'd like to see accomplished during my time as NCRAL Chair:

- I want to develop and make use of an unofficial advisory group employing electronic means. The Executive Council, according to our Bylaws, consists of the Region's three elected officers (Chair, Vice Chair, and Secretary-Treasurer) and the Regional Representative to the AL. The NCRAL Council consists of the Executive Council members along with presidents of all NCRAL-affiliated associations plus one member appointed at-large. This latter group is constrained to act only during Regional meetings according to the Bylaws. I honestly feel that the Chair needs a rich and varied sounding board outside of regular annual membership meetings, and an advisory group can provide just that.
- I want to increase the use of social media to reduce the "isolation" that members-at-large and even some clubs and club members certainly must feel. This will start with growing the use of Facebook. We already have a Facebook page, and I hope that you are following. It can be found at: <https://www.facebook.com/northcentralregionastronomicalleague/>. One of the opportunities this Facebook page offers is to have club events, member education, public outreach, and astrophotography showcased.
- I want to increase the content of the NCRAL website. I have started by posting the NCRAL Bylaws that I never saw until I received a copy of official papers from past Chair Gerry Kochen. As part of this effort, I'd like to showcase on an annual basis the NCRAL Award winners. Those so recognized are marvelous examples of what the best of the best looks like in the field of amateur astronomy, and they can serve as shining beacons for those who seek ways to better not only themselves, but improve the world of amateur astronomy and share it with members of the public. It would be nice if we could prepare links to all past NCRAL Award winners. I urge you to provide information about yourself if you are a past recipient of this Award. See the new post about 2017 NCRAL Award recipient David Leake (Champaign-Urbana Astronomical Society) at <https://ncral.wordpress.com/awards/> as an example.
- I want to use my position as Chair as an avenue to reverse some of the trends that we see happening in amateur astronomy. The "graying" of our membership and the apparent disinterest of youth in what is to most of us a very interesting hobby. Nowadays, we find kids thumbing their cell phones and fingering their electronic tablets at the cost of both interpersonal communication and active engagement.

ment in hobbies. I'd like to see amateur astronomy at least make a dent in that problem. I'd especially like to coordinate with groups who set their minds on doing an education/public outreach (E/PO) project – a theme close to the heart of former AL national Chair Barry Beaman (Rockford Amateur Astronomers, Illinois). Perhaps we can find you some support – material, financial, and/or member – from within NCRAL for doing so. The Region is sitting on some significant financial reserves (see the Treasurer's report in this issue of **NORTHERN LIGHTS**), and I'm thinking that we should be putting some of that money to work by funding long-term E/PO efforts for clubs addressing members and non-members alike.

- I want to promote attendance at our annual spring Region meeting. These are wonderful opportunities to meet old friends, make new friends, learn new things, and encounter new experiences. Only a tiny percentage of our membership currently attends our spring meetings, and I'd like to see that number increase. I'd also, at the same time, like to promote attendance at the national AL meetings. While time is too short to do much now in relation to AstroCon 2017 at Casper, WY, we must be vigilant of the fact that the national meeting will be held in our Region (Minneapolis, MN) during 2018. I want to see a big turn out from NCRAL in support of our hosts and colleagues in the Minneapolis Astronomical Society.
- I want to strengthen the scope and length of the **NORTHERN LIGHTS** newsletter. I'm looking to work with our co-editor Jim Gibbs to do so. However, because I now have additional duties, I'm promoting him to my former position of Editor-in-Chief. I'll still provide content for the newsletter to Jim by being his assistant, but I hope that our membership will do so as well. Jim is still rather busy with his day job, but I am retired. Therefore, I'm asking the Region's newsletter editors to send me complimentary copies of their publications. Electronic versions can be emailed to me at carlwenning@gmail.com or sent via US Mail to Carl Wenning, NCRAL Chairman, 21 Grandview Dr., Normal, IL 61761-4071. I will read them and find little "AstroBits" worthy of sharing with the broader membership within our Region. As an electronic publication, **NORTHERN LIGHTS** can be increased in size pretty much without limit as there are no publishing and mailing costs. I'm asking our readers to begin contributing like a few others already have.
- I want to promote observing using the AL observing programs as a corridor. I was surprised to learn that many of our members present at NCRAL 2017 have never completed a single AL observing program. I didn't discover the real joy of observing until after I completed my first observing program decades ago. I'd like to see others catch this observing "bug."
- I want to encourage participation at state-level star parties. There are several that take place within our borders each year, and we will use the newsletter, Facebook page, and website to encourage participation. This might permit me as Regional Chair to reach out and visit with many of our otherwise non-participatory members and groups within the Region. Contact me if you have an event at which you'd like me to speak. I can't guarantee agreeing to do so as I have a pretty hectic schedule, but will try to do so when the opportunity presents itself. Nearer to home (say within Illinois), I'd be happy to attend and speak at one of your regular club meetings if that can be arranged.
- I want to conduct one or more surveys to get a sense of what Region members like, want, and will agree to. As a Region, we should look to fulfill the wants and needs of our members and those whom we serve.

I must admit, this really is a lot of "I want to..." statements. I know that I cannot do them all on my own in a two-year term, but I'm certainly willing to try with your help. I'm therefore asking YOU to step forward to offer your ideas, advice, and assistance as wants and needs presents themselves. I'm always open to new suggestions, and hope that you will offer them from time to time.

First and foremost, I'm asking the presidents of all NCRAL-affiliated club to contact me if they wish to serve on the advisory group. Service is voluntary; no one will be compelled to do anything. The work of the group will be done electronically using email by in large, and I don't anticipate that it will take much time. I would like to use it as a sounding board for ideas if nothing more. If you want your club's voice heard, then please respond to my request by emailing me at carlwenning@gmail.com placing "NCRAL Advisory Group.

Second, if you are a past NCRAL Award winner, then it would be nice to have your biographical sketch on the NCRAL website under the following URL: <https://ncral.wordpress.com/awards/> As a past award winner I'll be sending my nomination letter to webmaster Jeff Setzer for linking to this web page. I hope other Award winners will do the same. It's more than a point of pride; Award winners are those shining points of light who show what can be done with a bit of effort.

Third, if you have something to share – an article, a resource, an image, a star party announcement – please send it my way for inclusion in the **NORTHERN LIGHTS** newsletter. Editors, please do send me electronic or hard copies of your newsletters as they become available. I'll glean from them interesting news notes for our 7-state Region in place them in the newsletter each quarter.

Lastly, as we are now at the beginning of summer, I hope that you have already made plans to truly experience (not just "see") the August 21st total solar eclipse. Illinois will be the only NCRAL state to experience this event, so come on down! If you have not read up on this event yet, consider getting a copy of the 24-page booklet The Great Eclipse described elsewhere in this issue of the newsletter. It's not too late to start selling these as money-makers for your club.

Carl Wenning
NCRAL Chair

NORTHERN LIGHTS EDITOR'S MESSAGE

We are excited that the **NORTHERN LIGHTS** continues to grow and expand both in readership and content. With every new edition more clubs and member throughout the North Central Region contribute with interesting articles, accolades and recognition to fellow members and announcements. It is important to notice that the **NORTHERN LIGHTS** is intended to be a medium to use to share and broadcast news and ideas and this is exactly what it is becoming. I am looking forward to the continuing expansion of this publication by creating new columns and sections that will benefit the North Central Region audience.

This Summer 2017 issue of **NORTHERN LIGHTS** continues to be filled with information and news throughout the region as well as great articles and astroimages. I want to acknowledge the contributions of the following NCRAL members to this issue in order of appearance: Gary Henkelmann, Door Peninsula Astronomical Society; Dave Falkner and Valt Treibergs, Minneapolis Astronomical Society; David Leake, Champaign-Urbana Astronomical Society; Jean Napp, Starsplitters of Wyalusing & Iowa County Astronomers; Dino Milani, Popular Astronomy Club; John Heasley, Driftless Stargazing LLC and Terry L Dufek; Tim Stone, Twin City Amateur Astronomers and Jamey Jenkins, Twin City Amateur Astronomers.

Also, I want to briefly echo Carl's words in thanking the departing leadership and welcoming the new one. I further thank Carl for the past years contributions as Editor-in-Chief of the **NORTHERN LIGHTS** as well as the Regional Representative and his lasting support. I look forward to continue working with Carl, the other leaders and the various clubs throughout the North Central Region that contribute to success of this newsletter.

This newsletter now contains 5 important purposes:

- It serves as a benefit of membership to our NCRAL-affiliated clubs.
- It helps get the word out about events nationally and in the North-Central Region of the Astronomical League.
- It provides an avenue for members' contributions to be published for readers across the NCRAL region.
- It is a link for Astronomical League members-at-large who reside in our region.
- It provides a potential avenue to recruiting new clubs that are not currently NCRAL affiliated.

The editors hope that this newsletter makes its way to ALL members of AL-affiliated clubs in the North-Central Region, as well as to the Region's members at large. **NORTHERN LIGHTS** is disseminated via email through a network of club ALCor's, presidents, and newsletter editors, as well as directly to members at large whose email addresses we have. The newsletter is intended for all NCRAL members, not just these leaders and at-large members. So, if you are a club member and haven't received your copy through one of your club's leaders (but have found it by way the [NCRAL website](#) or the [NCRAL Facebook page](#)), you might want to contact your club's leadership. Perhaps I don't have your ALCor's, president's, and editor's email addresses in my database. If you think not, please send their email information my way.

Our Intention for the times ahead is to grow the **NORTHERN LIGHTS** so it is an useful tool to inform and disseminate information to the North Central region about activities and promote collaboration among the clubs and members. If you have an idea to improve this publication or start a new column, section, have a comment about something that can be done better or want to share your ideas by writing and article please send me your suggestions or any material to be consider for publication to the email listed below.

Clear skies,

Jim Gibbs, Editor-in-Chief
(Twin City Amateur Astronomers)
jrgibbs@msn.com

NCRAL ON FACEBOOK

Did you know that NCRAL now has a Facebook page for sharing information about your Region's AL-affiliated clubs? This is 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/>

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.

MINUTES OF THE NCRAL 2017 CONVENTION

April 22, 2017
Eagle Bluff, Minnesota

Regional Council Meeting

Chairman Kocken called the Council meeting to order at 3:56 pm. It was determined that a quorum was there to proceed. Fifteen societies were present. Secretary Klemt read the minutes from the 2016 meeting. A motion was made to accept the minutes as read. The motion was seconded and approved. There was no old or new business. A motion was made to adjourn the council meeting. It was moved and seconded and approved. We adjourned at 4:03 pm.

Regional Business Meeting

Chairman Kocken called the meeting to order at 4:04 pm. Treasurer Klemt gave the financial report, showing a balance of \$9052.75 in our checking account. Vice-chairman Charlotte DuPree gave a report on the NCRAL Regional Award. She encouraged all clubs to recommend deserving amateur astronomers for the regional award. There are many deserving members who give of their time tirelessly to promote amateur astronomy as an outreach in their areas.

Chairman Kocken next spoke of the importance of communication between the clubs in the Region (5 states). Kocken thanked Carl Wenning and Jim Gibbs for reviving the **NORTHERN LIGHTS** newsletter that services our region. Carl then asked for assistance from the membership to provide articles for the newsletter in the coming year. Wenning then gave a detailed report on the 2016 Alcon convention and board meeting in Washington DC. He mentioned the 2017 Alcon convention would be held the week of the total solar eclipse in the US next August in Casper, Wyoming. The convention is already sold out!

There was no old business.

Under new business, the 2018 NCRAL convention will be held in Door County, Wisconsin, hosted by the Door Peninsula astronomy club. The 2019 convention is tentatively scheduled for the Quad cities (Illinois and Iowa), possibly hosted by the Popular Astronomy Club. The years 2020 and 2021 will be held in Port Washington, WI and Green Bay, WI respectively.

The next order of business was the election of Chair and Vice-chair. Nominations were called for from the floor for Chair. Carl Wenning from Bloomington-Normal, Illinois was the only nominee from the floor for chairman. Nominations were closed and Carl was elected.

Nominations for Vice-chair were called for from the floor and John Attewell from Rochester, Minnesota was nominated. No other nominations were received and nominations were closed and John was elected.

Because Carl, our Representative to the AL Council, was elected Chair of the Region, he is not allowed to hold 2 offices. We then opened the floor for nominations for Representative. Bill Davidson and David Falkner were nominated for the position of Representative. Nominations were closed and Bill Davidson was elected.

Kocken then gave a report on next year's convention in Door County, Wisconsin, possibly the first week in May. Kocken then thanked the Rochester club for putting on an outstanding convention. The meeting was adjourned at 3:54 pm.

Respectively submitted,
Don Klemt, Secretary-Treasurer

NCRAL BYLAWS NOW 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/>

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.

REGIONAL OFFICERS & LEADER CONTACT INFORMATION

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

Bio: Carl has been an amateur astronomer since being introduced to the sky by his grandfather during July 1957. Today he is a 38-year member of the Twin City Astronomers of Bloomington-Normal, IL. He is an AL Master observer who makes frequent use of his CPC 11" telescope. He is a former planetarium director and physics teacher educator who remains actively involved in astronomy education and public outreach events.

Contact: carlwenning@gmail.com



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

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, not New York) and was the planning chairman for the 2017 NCRAL conference held at the Eagle Bluff campus near Lanesboro, MN.

Contact: john_attewell@hotmail.com



Secretary-Treasurer: Donald Klemt (2-year term expires spring 2018)

Bio: Don has been in the Racine Astronomical Society for the past 30 years. His interest in astronomy started when his dad took him to Dearborn Observatory (Northwestern University) when he was about 10. He has been active in public outreach for all 30 years in the RAS. His scopes include a 20", 11", 10", and a 90mm solar scope. He has served as Secretary-Treasurer of the NCRAL for the past 11 years. Don is retired from the Chicago Board of Trade where he was a member for almost 40 years.

Contact: donklemt@ameritech.net



Representative: Bill Davidson (completing vacant 3-year term that expires spring 2019)

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 for 20 years, and serves as editor of the club's newsletter *RochesterSkies*.

Contact: rochesterskies@outlook.com



NCRAL Webmaster: Jeff Setzer (appointed)

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

Contact: astrosetz@hotmail.com



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 where he has been a member for 3 years. He is also a member of the Fox Valley Astronomical Society and the Northwest Suburban Astronomers in the Chicago area 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.

Contact: jrgibbs@msn.com



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 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

NCRAL ADVISORY GROUP

~ by Carl Wenning, NCRAL Chair ~

As indicated in the above NCRAL Chair's message, I am now turning my attention to creating an informal advisory group. There are currently two formal councils that govern the region. From Article II, Section 5 of the Bylaws we read,

The NCRAL Officers, together with the Regional Representative to the League Council, shall constitute the Executive Committee of the Council. The Executive Committee shall be empowered to act on behalf of the Council, and with its full authority, on matters requiring its action at such times as the Council is not in session.

The "Council" so named in Article II, Section 5 is the NCRAL Council. This Council is described in Bylaws Article III, Section 1 as follows:

The affairs of the NCRAL shall be administered by a Council, consisting of the Regional officers, the Representative to the National Council, the President or the Presidents proxy from each society, a second representative from each society, and one representative selected from and by the members-at-large in the NCRAL who are in attendance at the meeting.

This rather burdensome rule seems to preclude any action of the NCRAL Council outside of Regional meetings. So, to increase the opportunity for NCRAL-affiliated associations to provide input to the leadership process (e.g., suggesting future directions for NCRAL, recommending events and activities, answering survey questions, etc.), I want to establish an informal advisory group to advise me as your new NCRAL Regional Chair. This advisory group will receive requests for commentary and suggestions using email only. The work will be irregular, and not very time consuming. Of course, I'm always ready and willing to receive recommendations from my fellow Executive Council members and, in fact, have received some good advice and suggestions already.

I hereby ask the presidents of all NCRAL-affiliated associations to appoint one member to serve on this informal advisory group with no defined term. Presidents are welcome to serve if they are willing to provide advice. Alternatively, the ALCor might serve in this role, another officer, or any other member. I'd also like to include a representative number of "members-at-large" who otherwise would have no voice.

Presidents, please email me at carlwening@gmail.com with your appointment providing name, club affiliation, and email address. Members-at-large, please feel free to nominate yourselves. Please do so soon, as I'm planning to move ahead with variety of initiatives outline in the NCRAL Chair's Message and certainly can use some immediate input.

ALCON 2018 COMING JULY 11-14

~ by Dave Falkner and Valts Treibergs, Co-chairs ~



Gleaned from **GEMINI**, a publication of the Minnesota Astronomical Society.

nightly observing. Several planets will be visible, including Jupiter and Saturn. Mars will be within a couple of weeks of its very favorable opposition.

Along with several speakers from the five-state area, we will bring in a few nationally known speakers. We have already secured Bob Berman, author of the "Strange Universe" column in *Astronomy* magazine; and outreach advocate Dr. Pamela Gay, director of CosmoQuest, director of technology and citizen science at the Astronomical Society of the Pacific, and host of the podcast "Astronomy Cast." We hope to get one or two other national speakers.

The Minnesota Astronomical Society will be hosting the Astronomical League National Convention in 2018. The dates of ALCON 2018 are July 11-14. The convention will be held at the Hilton Minneapolis/St Paul Airport Mall of America near I-494 and 34th Avenue South. We will have field trips to Eagle Lake Observatory and other attractions in the Twin Cities, such as the Bell Museum, the Science Museum of Minnesota, and the Mall of America. We will host a "star-b-q" at Eagle Lake Observatory (ELO) in Baylor Regional Park.

The theme of our convention will be Outreach. This will be a wonderful opportunity to show the world how we do astronomy in the Upper Midwest. We will also be able to showcase our world-class facility at ELO. We may have a couple of talks at the observatory and



SOUTHERNTOUCHPHOTO.COM

REPORT FROM THE NCRAL 2017 MEETING

~ by Carl J. Wenning, Twin City Amateur Astronomers ~

The Rochester Astronomy Club (RAC) hosted the NCRAL 2017 conference at Eagle Bluff Environmental Learning Center just outside of Lanesboro, MN, April 21-23. This annual event serves to bring together members of the North Central Region of the AL (North & South Dakota, Wisconsin, Minnesota, Iowa, Illinois, and the UP of Michigan) once per year for camaraderie, presentations, discussions, and observing. This year more than 70 registered to attend the event. By all estimates, this gathering was a resounding success, and will serve as a model of "how to do it right" for years to come.

This year's effort was led by John Attewell of RAC. He was ably assisted by members of his club, including Mike Carlin who worked in advance with the speakers to ensure "seamless" presentations. The site selection was superb, the housing very nice, the food great, the talks memorable, and the agenda impeccable. Everything ran on schedule.

The main program consisted of eight invited speakers whose presentations were captivating. Activities kicked off on Friday afternoon with two programs by Jeff Boland, Eagle Bluff Interpreter, using a portable Star Lab planetarium. On Friday evening, after a scrumptious dinner featuring a baked pork roast entrée, conferees assembled to enjoy the evening's offerings.

A warm welcome was provided by NCRAL 2017 Chairman John Attewell, and Jay McLaren, also an RAC member, provided an excellent summary of AL observing award recipients present at the meeting. He recognized first and foremost the seven Master Observers present in the group, and pointed out that among the group were many who had earned from 1-4 and then 9-20 observing program awards.

Attendees then listened to a captivating talk by Dr. Robert

Mutel from the University of Iowa who spoke primarily about low-cost spectroscopy using small telescopes. He focused attention on how both simple (grism = grating + prism) and complex (echelle) spectrometers work, and what results can be achieved through their use.

Saturday morning saw three talks. Carl Wenning of the Twin City Amateur Astronomers started off the morning with a talk about his proposal for an Astronomical Bucket List observing program. Dr. Armando Manduca of the Mayo Clinic in Rochester followed with a fascinating talk about the Hooker 100" telescope at Mount Wilson and how it has proven to be one of the most productive instruments in the history of astronomy. Following a group photo and a break, the morning was rounded out with a talk by Dr. Steve Kawaler of Iowa State University who spoke magnificently about how astronomers are going about their work to find and work out the "architecture" of planetary systems using stellar variability.

Following lunch, high school teacher Russ Durkee of the Minnesota Astronomical Society gave a very impressive talk about the "Shed of Science" that he maintains in his backyard just south of downtown Minneapolis/St. Paul. He uses a 20" PlaneWave telescope on an AstroPhysics mount under a light-polluted sky to conduct significant scientific work with high school students. Karl Young from the University of Minnesota then gave a basic presentation about measuring the cosmic microwave background using balloon-borne telescopes. The afternoon's program was concluded with a fast-paced review of 500 years of work of the best-known names in astronomy by Dave Falkner of the Minnesota Astronomical Society.

Following these talks and prior to supper, the NCRAL annual business meeting was held. After a society roll call, Secretary-

Treasurer Don Klemt read the minutes of the last meetings, and gave a current financial report.

Vice Chair Charlotte DuPree gave a quick update on the NCRAL Award process, and noted that we have a recipient for 2017 who will be announced just before the keynote address later in the evening.

In his Chairman's report, Gerry Kochen thanked Carl Wenning and Jim Gibbs for resurrecting the **NORTHERN LIGHTS** regional newsletter, and thanked to Jeff Setzer for keeping up the NCRAL website. Gerry reminded everyone of the importance keeping officer information up to date with the both the AL national office and NCRAL newsletter editor Carl Wenning, and the importance of AL observing programs.

Region Representative to the National Council, Carl Wenning, reported on the 2016 Astronomical League Council meeting in detail, and provided a summary of ALCon held in Arlington, VA, last August.

A call for nominations was then made followed by elections with the following results: Carl Wenning, Twin City Amateur Astronomers, Chair (term expires 2019); John Attewell, Rochester Astronomy Club, Vice Chair (term expires 2019); Bill Davidson, Rochester Astronomy Club, Region Rep. (completing last two years of Carl Wenning's unexpired 3-year term); Dave Falkner, Minnesota Astronomical Society, Alternate Regional Rep. at AstroCon 2017, and Don Klemt, Racine Astronomical Society, will continue as Secretary-Treasurer (term expires 2018).

After a scrumptious supper featuring roasted chicken breasts with wild rice pilaf, the main program continued with the presentation of the NCRAL Award. This year NCRAL honored Dave Leake of the Champaign-Urbana Astronomical Society in recognition of his long and extensive record of providing service to the public through amateur astronomy.

The evening ended with the keynote address by Dr. Jennifer Anderson of Winona State University who wowed the audience

with her impact crater research. She figuratively "blew the audience away" by simulating the impact of a 100-meter-wide meteor crashing into Duluth, Minnesota at 15,000 miles per hour. She went on to describe the devastating consequences of such an event which left many listeners shocked.

Afterward, observers were again "wowed" by a perfectly clear and very dark sky with excellent viewing conditions. The only interference was a light dome to the northwest produced by Rochester, and a continuous glow of diffuse light spanning the northern horizon which was nothing less than the **NORTHERN LIGHTS** resulting from a recent coronal hole on the sun.

The program ran like clockwork due to careful ministrations by program chairman John Attewell. There was plenty of time to socialize during well-spaced breaks. The Friday evening social provided the first such opportunity. It was well stocked with refreshments and treats of all sorts, and continued late into the evening due to the very hazy sky which began to partially clear just before midnight. Meals and observing on Saturday evening also provided other much needed opportunities to making new acquaintances and renewing old ones.

The site chosen for the conference was about 40 miles southeast of Rochester, MN, in the rolling hills of south central Minnesota. The Eagle Bluff Environmental Learning Center holds residential programs for youth throughout the year, and is staffed by 12 full-time and 12-part time nature interpreters. There is also a staff responsible for catering the needs of camp residents. The meals were far above the quality normally experienced in other outdoor programs.

While we had a good turnout, it's unfortunate that more NCRAL members didn't experience this exemplary meeting. While it is now history, future hosts should take note about how to host such a meeting by reviewing the record. Thanks to John Attewell and his Rochester Astronomy Club conference planning team on doing an exceptional job with less than a year to prepare!



The NCRAL 2017 observing field at Eagle Bluff, Lanesboro, MN. Image courtesy of Claire & Bob Gadbois (Chicago Astronomical Society).

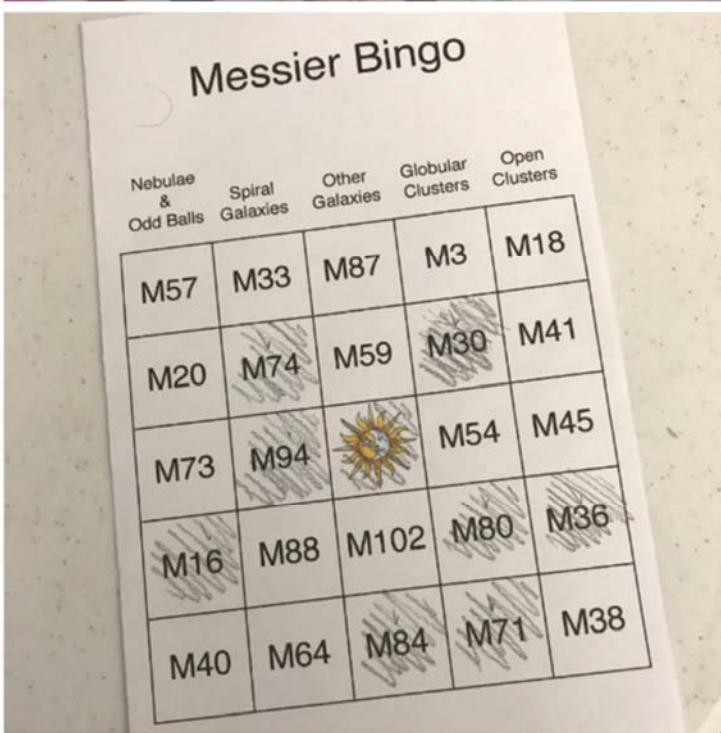


An aerial view of the NCRAL 2017 observing field courtesy of Randy Hemann (Rochester Astronomy Club).

IMAGES FROM NCRAL 2017, LANESBORO, MN, ROCHESTER ASTRONOMY CLUB Host



Images courtesy of Claire & Bob Gadbois (Chicago Astronomical Society) and Carl Wenning (Twin City Amateur Astronomers)



Images courtesy of William Davidson (Rochester Astronomy Club)

ECLIPSE STAMP 2017



The Total Eclipse of the Sun, Forever® stamp transforms into an image of the moon from the heat of a finger. Fred Espenak shot the eclipse photo from Jalu, Libya in 2006, while the full moon image was made from his observatory in Portal, Arizona in 2010. The stamp commemorates the total solar eclipse of August 21, 2017 that crosses the U.S.

The Postal Service has just released a first-of-its-kind stamp that changes when you touch it. The Total Eclipse of the Sun, Forever® stamp, which commemorates the August 21st eclipse, transforms into an image of the Moon from the heat of a finger. The First-Day-of-Issue ceremony took place on the summer solstice, June 20th, at the Art Museum of the University of Wyoming (UW) in Laramie. Images were taken by well-known eclipse chaser Fred Espenak.

ASTROBITS – NEWS ITEMS FROM AROUND THE REGION

Editor's note: *AstroBits are gleaned from the newsletters and announcements of NCRAL astronomy clubs sent to the editors of **NORTHERN LIGHTS**. If you would like to have the spotlight regularly shown on your group, be certain to have your club's editor forward a copy of your newsletter to assistant editor Carl Wenning.*

- ◆ Make plans now to attend Northwoods Starfest 2017. This event will be held August 25-27, and is sponsored by the Chippewa Valley Astronomical Society. The event will be held at Hobbs Observatory which is in the Beaver Creek Reserve near Fall Creek, Wisconsin. Details are available at <http://www.cvastro.org/northwoods-starfest>
- ◆ The Sangamon Astronomical Society (Springfield, IL) will host the Illinois Dark Skies Star Party September 21-23. The event will be held at the Jim Edgar Panther Creek State Fish & Wildlife Area in west central Illinois. Detailed information and registration is available at <http://sas-sky.org/2017-idssp/>
- ◆ ASTROCON, the AL's national convention, is being held this year in Casper, Wyoming. The event will run August 16-19, and is on the center line of the August 21 total solar eclipse. Details are available at: <https://astrocon2017.astroleague.org/>
- ◆ Did you know that over two million pairs of eclipse glasses will be distributed free through public libraries in anticipation of the August 21st total solar eclipse? More than 2,000 public libraries will receive a package of hundreds of free solar glasses, plus an information booklet on how to do public outreach relating to the total solar eclipse. (See <http://www.starnetlibraries.org/EclipseGuide/>). Thanks to the Gordon and Betty Moore Foundation (with additional help from Google) for making this program possible.
- ◆ Do you need more information about the upcoming total solar eclipse? Check out the following website for detailed coast-to-coast information: <http://www.greatamericanclipse.com/>
- ◆ The Champaign-Urbana Astronomical Society is looking forward to constructing a 24'x30' roll-off-roof observatory at their observing site southwest of Champaign-Urbana, Illinois. The plan right now is install a C14 telescope. It is anticipated that the observatory will be fully operational by late summer. This caps off several years of successful fund raising.
- ◆ The Twin City Amateur Astronomers are in the process of establishing a dark sky observatory outside of Waynesville, Illinois. This new site is located about 20 minutes south of the club's other two observatories at Sugar Grove Nature Center which were showcased at NCRAL 2016. The new facility will be 10' x 28' structure, will feature a Pier-Tech roll-off-roof, and a 24" f/11 corrected Dahl-Kirkham telescope on a yoke mount. A second wide-field telescope will be added later. Also, there will be a 10'x28' observing pad for portable telescopes. It is expected that the observatory will be fully operational by late autumn.
- ◆ The Astronomical League is currently holding its election for Secretary. Voting must be completed and the ballot postmarked by July 31 to be counted. If you have not received your ballot, please contact the Astronomical League office. Details can be found at <http://www.astroleague.org>
- ◆ To help make the Astronomical League function more smoothly, please remind ALCors to update your association's membership information with Mitch Glaze at the League's national office. Associations should send their rosters to roesters@astroleague.org on a quarterly basis.
- ◆ **NORTHERN LIGHTS** is distributed to the NCRAL membership through our website, our Facebook page, and by direct email to club leaders. To ensure that your club receives NCRAL's **NORTHERN LIGHTS** newsletter in a timely fashion, please be certain that that this newsletter's assistant editor has current email addresses for your club's ALCor, president, and newsletter editor. If not (and even if you are not sure), please send names and email addresses to carl-wenning@gmail.com so he can update or verify current distribution information.
- ◆ We need to be thinking ahead to next year and the years following. Keep in mind that at NCRAL 2018 we will be holding an election for Secretary-Treasurer. Don Klemt's term has expired and he cannot be re-elected according to NCRAL Bylaws. We also need to think about future meeting hosts. NCRAL 2018 will be hosted by Door Peninsula Astronomical Society (Wisconsin); Popular Astronomy Club (Illinois) currently is looking into the possibly hosting NCRAL 2019. We look forward to hearing from them soon.
- ◆ The Door Peninsula Astronomical Society will be celebrating the dedication of Wisconsin's first International Dark Sky Park on Thursday, June 22, at 1:00 PM. The event will be held at Newport State Park in Door County. A time of gathering and refreshments will follow the dedication. The event is open to the public; no reservations are required. The ceremony will be held at Newport Park, 475 County Road NP, Ellison Bay, WI, parking lot 3.

2017 NCRAL AWARD WINNER

~ Mr. David Leake Champaign-Urbana Astronomical Society ~

Editor's note: The following article is a slightly revised version of the nomination letter written on behalf of Dave Leake by Erik Johnson, Treasurer of the Champaign-Urbana Astronomical Society. It is published here with his permission. This article also can be found linked to the recipient's name on the NCRAL website at <https://ncral.wordpress.com/awards/>.

Dave Leake has epitomized public engagement in astronomy in East Central Illinois for over 30 years. Aside from his work as an astronomy and physics professor at Parkland College and director of Staerkel Planetarium at Parkland Community College, Dave has been the linchpin of the Champaign-Urbana Astronomical Society (CUAS) since its inception in 1986. As a longtime member of the CUAS put it to me, Dave "has been president, historian, storyteller, public relations officer, public outreach dreamer, star guide, astronomy dictionary, and the list goes on."

Dave was instrumental in the founding of the CUAS, whose beginnings were tied to Halley's comet. In 1985, to promote the appearance of the comet and to explain how to observe it, Dave ran a basic astronomy course for the Champaign Park District. The students' interest in continuing with the hobby led to the formation of the CUAS. Dave composed the proposal for the club to the park district, informed current and former students about the new club, coordinated the first meeting, served as the president, and wrote the first newsletter. He has served as president for several years (1986-1990, 2011-2014, 2017-) and he has edited the newsletter for 28 of the club's 31 years (1986-2007, 2010-). He also arranged the club's association with the planetarium, which has hosted our monthly meetings since 1991.

While Dave promoted the new club, he was a guiding force in setting up the club's observatory. He served on the observatory committee that planned the site beginning in 1989. The committee acquired a 1920s dome from the University of Illinois' defunct Prairie observatory, leased the land for the site from the university, obtained a Vesto M. Slipher grant to pay for the primary mirror for the 16" Cassegrain, and contracted bricklayers to make the building. He even helped dig the dome footings by hand. In order for the club to hold a lease on the observatory site and maintain the property, Dave helped incorporate the club in 1991.

Dave has been working at Staerkel Planetarium since 1989. As planetarium director, he gives shows to over 20,000 visitors each year. He writes a weekly column about astronomy, *Prairie Skies*, for the Champaign-Urbana News-Gazette. He is a frequent interview subject for any astronomy news, and he promotes CUAS events in the paper as well. The local CBS affiliate, WCIA, often interviews him for astronomy news, and Dave was one of the hosts of *Surrounded by Science* on Parkland College Television. Dave's public outreach factored into him being honored with the outstanding Faculty Member Award by the Illinois Community College Trustees Association in 2005.

Each year, Dave is present at nearly all CUAS public observing sessions. When sessions are held at Middle Fork Forest preserve, Homer Lake Forest Preserve, Allerton Park, or the Decatur Astronomy Jamboree, Dave is almost always the person who gives a short talk to prepare people for the night sky. He organized the club's events for National Astronomy Day for several years, and has made

the CUAS a regular presence at *Science at the Market* at the Urbana Farmers' Market on Saturdays.

Dave has seen how light pollution has grown in our area and strives to preserve dark skies. He has advocated to city councils and to the university to install responsible lighting or light shielding. Recently, he encouraged the Champaign County Forest Preserve District to nominate the Middle Fork Forest Preserve to become an IDA International Dark Sky Park. He is working with them to complete the requirements.

Currently, Dave serves as the club's president and is on the instrument committee that guides our expansion of the observatory. When the club rejoined the Astronomical League, Dave was the first member to complete an observing program by finding 50 Messier objects with binoculars. He has a framed letter from Carl Sagan which guided his education and his outlook on public engagement. He has been the dominant force in making astronomy accessible and enjoyable to people in East Central Illinois for 30 years and has been integral to the success of the CUAS at the same time. It is with great pleasure that I nominate him for this award.

Erik Johnson, Treasurer
Champaign-Urbana Astronomical Society



Go OUTSIDE. LOOK UP. FALL IN LOVE.

~ by Jean Napp, Starsplitters of Wyalusing & Iowa County Astronomers ~

Twenty years ago, thirty-some children were running around my soybean field, taking turns looking at galaxies, planets, and star clusters through a telescope someone had brought out to my farm. I have no idea if the children remember that evening, but I do; that is the night I fell in love with the night sky.

At that time, I was busy with a young family and farm life, but I would often step outside on clear nights to find a few constellations. I clearly recall the first time I looked up and said, "That 'star' does not belong there. I bet it is a planet," and it was Mars!

In 2011, I discovered the Astronomical League observer programs. I was already working on the Messier objects, so it was a perfect fit.

Before long I started the Binocular Messier Program. I went from a 10x42 to a 15x70 and from a small camera tripod to a parallelogram-styled binocular mount. Soon I was finding a way to attach a red dot finder to the bins. This was my first taste of "normal gear expansion."

The Universe Sampler introduced me to a wide variety of observing options, and I learned that in the eyepiece, stars always drift west. I used this when doing the Double Star Program—I would hop across the sky to find the star and observe it for a while; then I'd let the stars drift west out of the eyepiece so I would know where to draw the secondary star. One night I pointed the scope, observed the star, and waited. And...waited. It took me a bit to realize that if I intended to sit there until Polaris drifted out of the eyepiece, I had better get comfortable.

I never thought it would be fun to search for features on the moon until I did the Lunar Observing Program.

The first night of the Meteor Program, I sat in my antigravity chair with a clipboard, papers, pencils, maps, and cats. I looked up; the cats tried to sit on my papers. I sat there an hour, and I am certain the only reason I did not fall asleep was due to persistent cats. I began to question the sanity of anyone doing this for 36 hours. But then I started googling and reading and learning and finding answers:

What is the difference between a bolide and a fireball, and how do I report it if I see one?"

There are SEVEN meteor showers going on tonight! How do I know to which shower each meteor belongs?

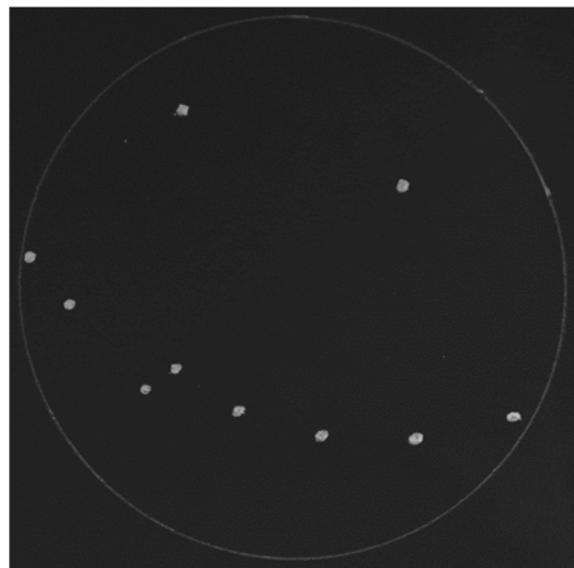
Meteor showers have *personality*: some tend to have meteors that explode, others slowly sail across the sky, and many are only faint whispers.

I can now say that I love meteor watching. Except in winter. Twenty-seven layers of wool, down, blankets, and sleeping bags are not enough to survive comfortably for one hour of a Wisconsin's below zero, wind-chill – not even with an electric blanket. I have also learned that not everyone understands our passion about the night sky; after I had finished the program, my son commented,

"You realize, don't you, that you sat in your chair and looked at one spot in the sky for a whole day and a half, right?"

And then I returned to one of my first loves—the constellations. Going out on the darkest nights, attempting to see the smallest stars, and placing dots on my page to make sky maps for the Constellation Hunter Program...well, all I can say is that the heavens are amazing.

Eventually, I decided to climb Mt. Everest and went nose-to-nose with the Herschel 400; there really is nothing like hopping half way across the universe to find a little gem hidden in the middle of nowhere. About that same time, I was working on the Asterism Program, so I was doing dim fuzzy blobs one night and BBQ forks and toadstools the next. I was quite certain asterisms were not on the same level as the Herschels until one evening:



"Find the closest star. Move the finder from here to here to here. The Cheshire Cat should be right. About. There."

I looked into the eyepiece:

Added to the wonder of the night sky is the excitement of the wildlife that visits me on the top of my hill: the raccoons, the coyotes, the foxes, the geese and owls, skunks and bears...but those are stories for another time. And to think all this started by some friendly person setting up a telescope in my soybean field—a good reason to start working towards the Outreach Award, don't you think?

Such beauty. Such magnificence.

Go outside. Look up. Fall in love.

PLANET X IS FOUND!

April fool? Maybe not... Planet X might be real.

~ By Dino Milani, Popular Astronomy Club ~

It was a warm summer day, 65 million years ago (we know about the weather because of the fossil record), when a comet struck the Earth and 70% of all living things – including the dinosaurs – died. When it hit, it formed a 130-mile-wide crater in the Yucatan peninsula of Mexico.

This wasn't the first time the Earth was hit. Large strikes that cause extinctions seem to happen about every 30 million years and the hits seem to have a rhythm of 26-32 million years. The largest ones were 145 million years, 215 million years, 250 million years (the

BIG ONE, where 90% of every living thing was killed), 360 million years and 438 million years ago. Smaller comets and asteroids hit in-between (only 10-50% of everything was killed) including the 35-million-year-old, 40-kilometer-wide, crater below Chesapeake Bay, Virginia. Smaller comet strikes that do not cause large extinctions hit every 10,000 years on average and the smallest yet, every 100 years, such as the comet that flattened 40 square miles Siberia in 1908.

There are comets all around us. Some orbit near Jupiter and the

sun, such as Shoemaker Levy 9, which broke into 9 parts and hit Jupiter in July 1992. Others orbit past Pluto reaching into the Kuiper Belt, such as Halley's Comet. The Kuiper Belt orbits around our sun, starting at 30-50 AU ("Astronomical Unit" the distance from our Earth to the sun) possibly ending at 800-1,000 AU. It contains ice dwarfs, micro planets, asteroids and comets. Most comets – over a billion – orbit further out, in the Oort Comet Belt, which begins about 3,000 AU and goes past 100,000 AU.

And something out there has been pushing comets at us every 30 million years or so. When more comets are pushed in, more comets hit our Earth, with some being very large and destructive.

What's causing these periodic strikes? Several hypotheses were put out in the 1980's and 1990's which have not yet been substantiated. Here are three of them.

First: "Nemesis" A companion star that orbits close to our sun every 30 million years and knocks-out comets from the Oort Comet Belt. Half of the knocked-out comets leave our solar system and half travel back toward our sun and Earth. We haven't found this star, Nemesis, and we have a better list of the other stars near us - and their orbits - none of which are near enough to cause the knock-outs.

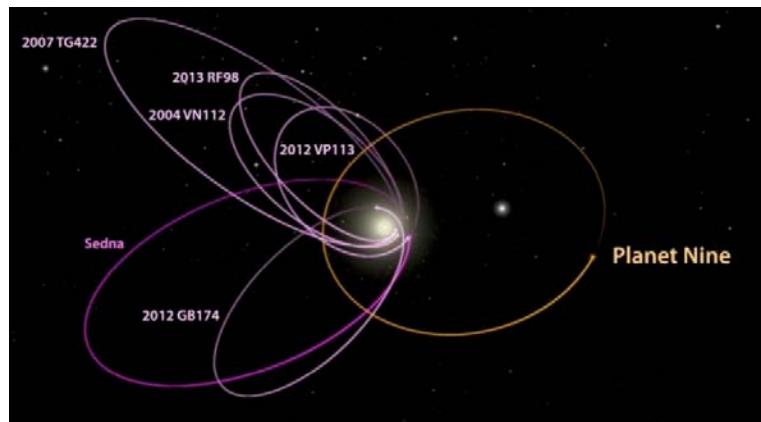
Second: "Planet X" A large planet is in the Oort Comet Belt. As it orbits, that planet knocks-out comets. Same as above, some comets are pushed out of our solar system and some are pushed toward us. Planet X was supposed to be as large as Earth but never found (more on this later) so this theory was discounted.

Third: "Galactic Rotation" Our sun travels around our galaxy and as we revolve around it our solar system moves up, then down, then up again – much like riding waves up and down on the ocean. At some point, our sun nears other stars or thick gas fields, which then knock out the comets. This one seems to be closer to the answer, but is still not proved.

Then, in 2015, something was found. A hidden planet (termed "Planet 9") was discovered in the Kuiper Belt and it may (or may not) be responsible for the periodic comet strikes. The hidden planet is larger and closer than Planet X was thought to be, but it could do the same thing - force comets close to us – if that can be proved.

The hidden planet could be 10 times the size of Earth but we can't see it; it's too far out and too dim to be seen with our current tele-

scopes. How do we know it's there? Mathematically! In their January 2016 *Astronomical Journal* article, Caltech astronomers Konstantin Batygin and Michael Brown found that 11 large bodies in the Kuiper Belt (dwarf planets and large asteroids, including Sedna, which is 995 km in size) had orbits that clustered together. Their orbits all went into the same area – clustered orbits – without hitting each other and were less than 30° apart. This couldn't have happened by chance! The probability is only 0.007% for it to have "accidentally" happened and the clustering couldn't happen unless there was a large planet *forcing* the orbits of these 11 large bodies together. The hidden planet may have an orbit that's 300 AU by 700 AU in size and its orbit passes through the orbits of the 11 other bodies. An orbit this large could take 10,000 to 20,000 years to complete. It could be many years before our telescopes are big enough and the hidden planet is close enough for us to see it. The hidden planet is big enough to cluster 11 large bodies, but is it responsible for the periodic strikes? Only more research will tell us, so we'll keep looking up!



This drawing shows the Kuiper Belt micro planets with their clustered orbits. Planet Nine's orbit passes through the other orbits and forces them to cluster together.

You can find information on-line for Planet 9; search for "Caltech 9th Planet Kuiper Belt". For comet strikes, read *Fire On Earth* by John and Mary Gribbin, 1996. To learn more about Planet X, read the article in *Nature* by Daniel Whitmore and John Matese, January 1985.

GETTING READY FOR THE AUGUST TOTAL SOLAR ECLIPSE: DIRECT VIEWING METHODS

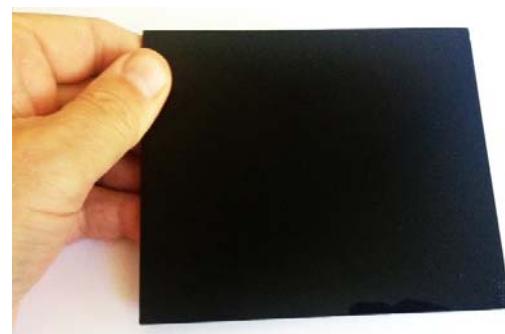
~ by Carl Wenning, Twin City Amateur Astronomers (IL) ~

I described indirect viewing methods for observing the sun in the Spring 2017 issue of this newsletter. In that article, I presented information about pinhole and eyepiece projection in their various forms, and noted the use of the sun funnel. Now, I want to continue sharing solar viewing techniques by describing various direct viewing methods that can be safely used during the August 21st solar eclipse or during other solar observing sessions.

The viewing procedures addressed here deal with the partially eclipsed sun. The totally eclipsed sun is quite dim as none of the sun's bright photosphere is visible, and the prominences and corona that extend out from the limb of the moon and are comparatively dim. When the sun is totally eclipsed, it is safe to view it without eye protection. If the intensely bright, partially eclipsed sun is viewed directly with the eye, there is a chance of solar retinopathy which will be addressed later in this article.

Glass Viewers

One of the simplest ways of viewing the sun safely is with a certified safe solar filter. Two common examples are eclipse glasses and arc welder viewing plates. Let's examine arc welder (not to be confused with gas welder) viewing plates first.



Above is an image of a 4½" x 5¼" filter used for carbon and shielded metal arc welding. In this case, we have a No. 14 viewing plate. This plate is dark enough to reduce the sun's intensity to safe and comfortable viewing levels. It reduces the sun's intensity by a factor of 100,000 times. In addition, it reduces to safe levels or altogether eliminates both infrared (IR) and ultraviolet (UV) radiation from the sun that can do damage to the observer's retinas without the observer being immediately aware. While not originally intended for solar viewing, arc welder viewing plates of densities No. 12 and No. 14 can be used safely view the sun, though No. 12 is said to produce images that are brighter than are comfortable for extended viewing. I therefore recommend the No. 14 viewing plate, and have been using mine for years.

Because arc welder viewing filters are made of optical glass and have extremely smooth and parallel planes on their large surfaces, they are ideal for solar viewing. The arc welder filter that I use for solar observing produces a beautiful green image of the sun. If the sun has on its surface a "naked eye sunspot or group" (visible to the unaided, but NOT unprotected eye), then this viewer will allow it to be observed.

The numbering system used for arc welder viewing plates and photographic neutral density filters are not the same. For a photo-

graphic neutral density filter with an ND or optical density number d , the fraction of the light transmitted through a filter can be calculated with the following formula.

$$\frac{I}{I_0} = 10^{-d}$$

So, with $d = 5$, $\frac{I}{I_0} = 10^{-5} = 1/100,000$ or 0.001%

Do NOT confuse neutral density numbers with arc welder filter numbers. Camera neutral filter ND 5.0 is the minimum for direct eye solar observation without damage of retina – at least as far as visual radiation is concerned. However, *one must be very careful with neutral density filters as they are designed for photography and might or might not block damaging IR and UV radiation like arc welder viewing filters.* Check with the manufacturer before using a photographic neutral density filter to view the sun with your eyes. In general, gas welder viewing plates are not safe for solar observation.

Polymer Viewers

Eclipse glasses also can be used to safely view the sun for extended periods of time. There are two basic types – black polymer and aluminized Mylar. These filters typically block 99.999% of the visible, ultra-violet, and infrared rays of the sun making them safe for direct solar viewing.

Some black polymer eclipse glasses produce a sharp, bright, orange image of the sun, while other black polymer eclipse glasses I have used provide a comparatively dim orange view of the sun. The phrase "caveat emptor" should apply before making large purchases for distribution through your group or astronomy club.

Aluminized Mylar filters can be used the same way as black polymer filters, though Mylar filters produce a light blue to neutral color balance of the sun depending upon manufacturer. Aluminized Mylar filters tend to be thinner and are sometimes subject to scratching and becoming riddled with pinholes if not properly protected. As with all such filters, if they develop scratches or pinhole or tears, dispose of them and get new ones.

Keep in mind that hardly anything besides the sun and arc welder sources can be viewed through these filters so optically dense are

they. When looking through these filters, don't expect to see anything but the sun.

As with all such solar viewers, it is imperative that they be used properly. Stand facing the general direction of the sun. Put the viewer your eyes and then look up. By sweeping your head up and down and back and forth you will quickly find the sun. Do NOT look at the sun and *then* place the filter in front of your eyes. Lastly, look away from the sun before removing eye protection.

Objective Filters

Objective solar filters are fitted into a cell and placed in front of the objective lens of a telescope or both objective lenses in a set of binoculars. Solar filters come in two basic types, each using a different substratum – either glass or a Mylar. Glass substrata are infused with sunlight rejection material that makes them safe for solar viewing. Mylar is typically over coated with a thin layer of aluminum making it safe for solar viewing.

For casual observations, either filter type is suitable for low-power solar viewing. However, because aluminized Mylar is very thin, it is frequently used as the filter of choice when viewing the sun at higher magnifications. A serious observer generally will select the Mylar filter over the glass filter for two major reasons.

First, the Mylar filter is optically thin and of such a quality that it causes minimal distortion to the light rays passing through it. This allows higher resolution views under good seeing conditions than is experienced with the typical glass filters. Second, most of today's high-quality Mylar filters transmit sunlight in a way that is not generally wavelength dependent. This allows the observer to see the sun in what appears to be its near natural color. The observer can therefore use different eyepiece filters to enhance the appearance of various solar features.

Mylar filters are available in two density levels – visual and photographic. Be certain to obtain the visual grade for general use. The photo grade transmits a greater amount of sunlight and is intended strictly for photography.

What NOT to Use

Sunglasses, smoked glass, crossed polarizing filters, gas welder's goggles, color photographic films, some neutral density photographic filters and the like are unsafe to use for making unassisted views of the sun. Though these items might reduce the intensity of the sun's visible light, they generally do not block out ultraviolet (UV) and infrared (IR) radiation that can cause eye damage without the observer being immediately aware.

Never use dark filters that screw into a telescope eyepiece. These are dark, absorb the highly concentrated solar rays and, if encased in a cell that provides no room for expansion, might explosively rupture. This will leave the observer's eye directly exposed to the concentrated radiation of the sun with potentially dire consequences.

Solar Retinopathy

Do not glance, look, or stare at the sun during partial phases as serious eye damage can result. Only when the sun is totally eclipsed by the moon is it safe to look at the sun. Only the sun's chromosphere and corona will be visible during totality, and trying to view them through solar filters will be impossible.

It's a common misconception that when, say, 90% of the sun's photosphere is eclipsed by the moon, that it's safe to look at the sun

because it's overall intensity is reduced. That's just not so. It's never safe to look at an eclipsed sun during the partial phases. While the landscape might be appreciable dimmed as we approach totality, the surface brightness of the exposed sun is just as bright as before. Rather than burning circular disks into your retina, you'll burn crescents!

Burns of the eyes' retinas caused by the sun are called solar retinopathy – literally retinal death. Eye damage of this sort might give no immediate sensation, and long-term eye damage can occur without the observer being immediately aware.

Looking directly at the sun without proper protection, even for a few seconds, can result in damage to one's eyes. The eyes' corneas and lenses will focus intense solar rays onto the light-sensing retinas. This is really no different than using a magnifying glass to focus the

sun's rays onto a piece of paper.

The consequence of such an action is to char the paper and perhaps even start a fire. Though staring at the sun for a short time will not cause one's eyes to burst into flames, it can produce photochemical injury to the sensitive retinal cells – particularly the macula – and produce long-term reduced visual acuity like snow blindness or welder's flash.

Symptoms of mild retinopathy might not disappear for several days to months after the eclipse. In moderate or severe cases, permanent vision loss can result.

DRIFTLESS DARK SKIES: SUMMER OF SATURN

~ By John Heasley, Driftless Stargazing LLC ~

There's a little bit of showmanship in sharing stargazing. It helps to be mindful that other people might not be quite as wowed as you are by the sight of a faint fuzzy thing in the eyepiece of a telescope (even if it is the combined light of hundreds of billions of stars that has been traveling tens of millions of years before ending the journey on our retinas). So you select what you share with care and save the most awesome for last. This summer, that's Saturn.

I love hearing the reactions of people when they see Saturn in a telescope: "wow", "groovy", "cool", "boss", "dope" or "sweet" depending on the generation. Some just curse reverently while a few check the telescope to see if I snuck in a picture. Saturn is stunning surrounded by its moons and rings. This summer, those rings are at about their widest when viewed from our planet.

Saturn will be its closest to Earth the night of June 14-15. During this opposition, Earth is directly between the Sun and Saturn, so we get to say "Saturnian Syzygy" because all three are in a straight line. Even at its closest, Saturn is still almost a billion miles from Earth. The sunlight we see reflected off Saturn and its rings left 75 minutes before we see it.

Look for Saturn this month in the southeast after sunset, in the south around midnight, and in the southwest before sunrise. It will be the brightest object in its part of the sky except for Antares (to its right) which has an orange-red color and is not quite as bright as Saturn. The viewing gets better as we get further into summer. On June 21st, Saturn rises in

the southeast around 8pm, is highest in the south at 12:30am, and sets in the southwest at 5:00am. It rises a half hour later every week.

Saturn is the slowest of the naked-eye planets. It takes almost 30 years to orbit the Sun and spends about 2 ½ years in each constellation as viewed from Earth. Saturn will be in Ophiuchus the Serpent-Bearer until November when it moves into Sagittarius the Archer. When you are stargazing in 2047, be sure to notice that Saturn has returned to Ophiuchus!

You won't be able to see it, but the [Cassini](#) spacecraft is nearing the end of its mission. It has been exploring Saturn and its moons and rings since 2004 and is running low on fuel. For its finale, it will make multiple passes through the rings of Saturn to make its closest observations ever. On September 15, it will be deliberately plunged into the atmosphere of Saturn so that any surviving microbes do not contaminate the moons of Saturn where there may be life. Imagine it orbiting the ringed world and enjoy your summer of Saturn.

John Heasley is an astronomy educator and stargazer who enjoys connecting people with the cosmos. He volunteers with NASA/JPL as a [Solar System Ambassador](#). For more information about stargazing in southwest WI, like [Driftless Stargazing LLC](#) on Facebook and find out whenever there's something awesome happening in the skies. Driftless Dark Skies appears monthly in the [Voice of the River Valley](#).

Solar Eclipse August 21, 2017

~ By Dino Milani, Popular Astronomy Club ~

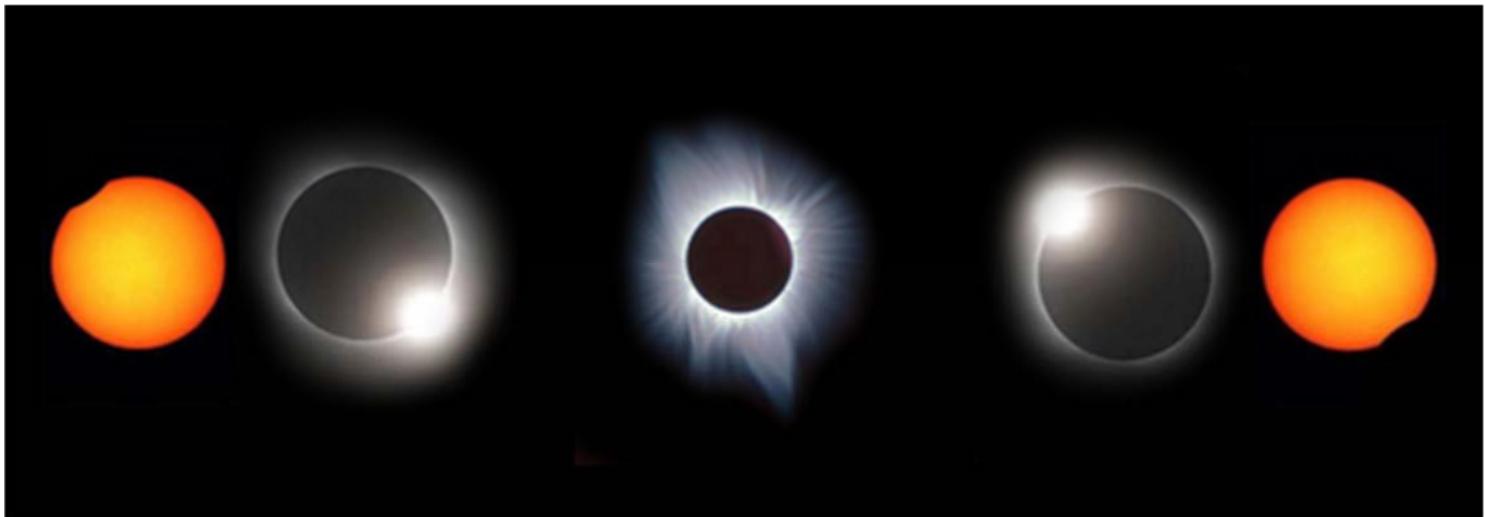


Image of the solar eclipse from Eclipse2017.org

On August 21st we will have an eclipse of our sun. Our moon will travel in front of the sun and block its light. As the moon's shadow travels across the Earth (if we are standing in the shadow) what we see is the eclipse of the sun. It should begin about 12:00 pm with the most coverage at 1:00 pm and finish about 2:00 pm. Here in the Quad Cities we won't see the full eclipse. We will have a partial eclipse with about 90% of the sun covered. When it happens the wind will slow down, animals will quiet down and it will get darker – much like dusk, when the sun sets. Those who can see the full eclipse will see the world turn dark – night time, no sunlight – and they will see stars appear and the planet Mars near the eclipsed sun.

How do one view the eclipse?

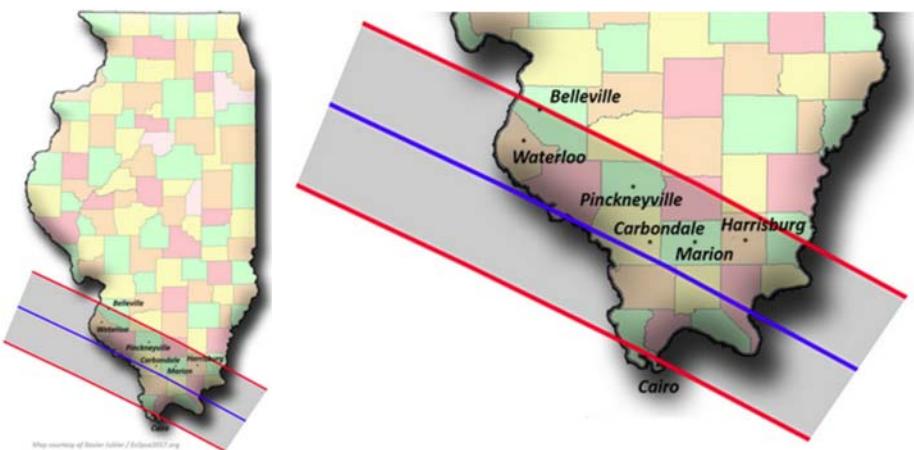
First: NEVER LOOK AT THE SUN! Do NOT look at the sun to see the eclipse. Looking at the sun will permanently damage your eyes. Sunglasses and welders goggles will not work, too much light passes through them and using them will damage your eyes. We have a club member who lived in Africa and worked at a school for the blind in Rhodesia. There were twenty students and all were blind because they looked at the sun, nothing else caused their blindness.

Second: One way to view the eclipse is to block the sun's light. Eclipse Glasses are the safest thing. They block 99.99% of the sunlight and allow you to see the sun and the eclipse. You may purchase Eclipse Glasses online at <http://www.eclipse2017.org> or reputable web sites. Follow the directions and if a hole appears in the lens discard it; it's better to throw it out and not hurt your eyes. Do NOT use Eclipse Glasses with binoculars or telescopes in front of them. The lenses

will magnify the sun's light, burn through the Eclipse Glasses and fry your eyes!

Third: There is a simple way to view the eclipse without looking at the sun. Find a cardboard box with an open side, such as a shoe box. Drill a small hole in one end and point the hole at the sun. An image of the sun will appear inside on the other side of the box. The image is reversed but the sun and the eclipse can be seen. Do NOT put your head in the box! Hold it away from you and look at the image through the open side. Tape a piece of paper inside – where the image shows – to improve how it looks.

Fourth: Solar filters for telescopes and binoculars may be purchased to view the eclipse. These filters fit on the front side (the side which points at the sun, the side with the large lens) and must completely cover the opening. Special care must be used with these items as you may still damage your eyes. Do NOT use anything that fits on the back side – the eye-piece end – as they may still damage your eyes. Consult with a professional, who has



Illinois 2017 Solar Eclipse map courtesy of Xavier Jubier, Eclipse2017.org

used the correct filters, before buying or using solar filters.

Fifth: See the partial eclipse on the 21st with our club at the Moline Public Library, 3210 41st Street, Moline, from 10:00 am to 3:00 pm. We will have our Mobile Observatory, properly filtered solar telescopes, Eclipse Glasses, solar displays and everyone is welcome to see the eclipse through our telescopes.

Sixth: To see the full eclipse you need to be on its main path. The eclipse path is about 70 miles wide and goes through Oregon, Idaho, Montana, Wyoming, Nebraska, Kansas, Missouri, Illinois, Kentucky, Tennessee, Georgia and North and South Carolina. The best viewing areas will be in Montana, Nebraska, Missouri, and southern Illinois.

OBSERVATORY EQUIPMENT FOR SALE

The late founder of the Sangamon Astronomical Society, Don Jardine, owned and maintained an observatory on his property north of Berlin, Illinois. Now, a year after his passing, Don's wife Virginia has decided to sell the property on which both home and observatory occupy. The observatory is capped with a 10-foot diameter Ash dome with lower drop out dome slot. The observatory houses a MEADE LX 200 telescope. Adjacent is a milling shop with a metal lathe. These items are for sale and must be transported from the property by the buyer. Delivery by the seller is not negotiable.

The Ash dome might be more than 40 years old but has been serviced by Ash as recently as 10 years ago. Rotation of the dome is motorized, but the slot is manually controlled. The asking price for the dome is \$10,000; however, this is a negotiable.

The telescope is a Meade LX 200 14-inch f/10; it is about 15 years old. It has most of its accessories. The telescope is believed to be functioning well, but has been used little in the past few years. The telescope has no tripod, but the mounting rests to a concrete pier inside the observatory. The asking price for the telescope is \$2500, and is negotiable.

The metal lathe is a Smithy Granite model 1324. Accessories and tools that came with the lathe are included. The asking price is \$1000 and is negotiable.

If interested in acquiring any of these items, contact Matthew Will at mattehew.will@att.net to make arrangement for inspecting the dome, telescope, or lathe. He is accepting quotes on behalf of Don's wife Virginia but she will have the final say on the terms of the sale.



BRIGHT PLANETS IN JUNE

~ By Terry L Dufek ~

One of the main questions asked at an astronomical outing by visitors is how to tell the difference between a planet and star. Both can be relatively bright but the main difference is that stars twinkle and planets do not. The stars, being so much further away, have an infinitesimal small surface size because of the distance, and the light from its pinpoint surface is scattered as it passes through the atmosphere so it twinkles. Planets however are much nearer and they have a relatively large surface area, compared to stars. The light correspondingly covers a larger area as it travels through our atmosphere to become a steady beacon in the sky. The only exception to this when the planet is low on the horizon and light going through the much thicker atmosphere may flicker.

Most of the bright planets and The Moon move in a path west to east across the sky. Sometimes they vary a little north or south of the path. Once you have located these unblinking beacons in the sky, you can watch as they change positions a little each night or more interestingly, you can watch as The Moon moves in its monthly orbit among them each night. Amateur astronomers are alert to possible interesting combinations of moon-planet-bright star arrangements in the sky. There are a couple of interesting arrangements this month.

It starts off on June 3rd with Jupiter only 2 degrees south of the slightly past, first quarter moon. Holding up your little finger, at arms-length, equals about one degree of sky so they are about 2 "little fingers" apart. Located high in the southern sky at 9:00PM, Jupiter is a brilliant object and in large binoculars or a small telescope, its four moons may also be visible. A little way northeast of the moon (following a line from Jupiter through the moon and on) is the bright star Arcturus, the fourth brightest star in the sky. Folding over your middle three fingers on your left hand and spreading out your thumb and little finger as far as you can, gives you about 25 degrees of sky. Putting your thumb on the moon and arranging your pinky up and to the left of the moon, should put you close to Arcturus. See if you can notice its twinkle. Down and left of the moon lies the star Spica, a bright blue giant which is the sixteenth brightest star in the sky. By making a loose fist, this covers about 10 degrees of sky. Just hold it up, at arms-length, so the right side of the fist is on the moon and left side is down and to the left and you should be close to Spica.

CHALLENGER LEARNING CENTER OF CENTRAL ILLINOIS PUBLISHES ECLIPSE GUIDE

The Challenger Learning Center (CLC) at Heartland Community College in Normal, IL, (co-host of NCRAL 2016) will soon publish a revised and updated version of *The Great Eclipse 2017: Observer's Guide for Illinois*. NCRAL members who attended NCRAL 2016 received a pre-production, draft version of this booklet.

This lavishly illustrated 24-page booklet is tailored to provide detailed information specific to Illinois observers, and includes scientific background, local circumstances of the eclipse, and a host of preparatory and eclipse day activities. Dr. Carl J. Wenning, member of the Twin City Amateur Astronomers and former director of the Illinois State University Planetarium, authored the publication.

The booklet is intended not only to inform the public about the August 21, 2017, total solar eclipse, but to provide observers with the information and basic tools to do so. Each copy of the *Observer's Guide* includes a set of certified-safe solar eclipse viewing glasses manufactured on behalf of the Astronomical League, the nation's largest association of amateur astronomers.

The distribution of this booklet is intended as a fundraiser for both the CLC and other educational non-profits willing to distribute this *Guide*. The author suggests that the publication either be sold for a minimum of \$10 or given in recognition of those who donate \$10 or more to a club, museum, or science center. The document is digitally printed on durable 80# velvet stock paper and is saddle stitched at two points near the center and trimmed on three sides.

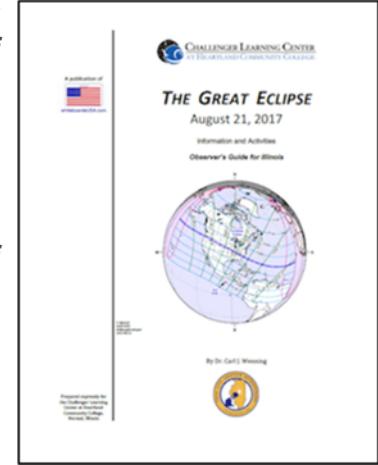
Pre-publication BULK orders are now being accepted by the CLC. Guides MUST be ordered in multiples of 20 only. Guides will be available in exchange for a donation of \$6.00 per copy to the CLC. Shipping and handling is included in BULK orders. Please remit your tax-deductible contribution (made payable to Challenger Learning Center – a federally registered 501(c)(3) educational non-profit) and mail it to the following address: Challenger Learning Center, Attn: Stacey Shrewsbury, Heartland Community College, 1500 West Raab Road, Normal, IL 61761-9446.

On June 9th, around 10pm, watch the Full Moon rising in the southeast. Saturn is 3 degrees (3 fingers) to the right of the moon. Through binoculars or a small telescope, Saturn's rings are plainly visible and one of the most spectacular sights in the Solar System. At moon rise, the Earth's atmosphere distorts and slightly magnifies the Full Moon which is interesting to view using a telescope. Viewing before it rises too far also cuts down on the brilliant glare of the Full Moon. If you look to the right (about 20 degrees or two loose fists of sky) of the Saturn-Moon pair, you will see a bright, reddish star known as Antares, a giant star located in Scorpius. Antares is also known as Anti-Ares or opposite of Mars because of its reddish color and is sometimes mistaken for Mars.

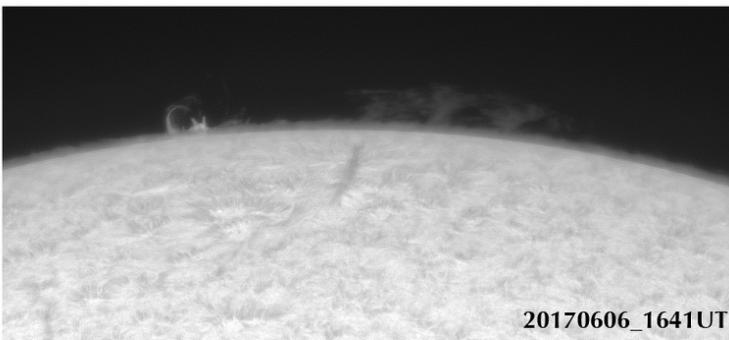
For the final bright planet currently visible, you have to get up early in the morning to see it (groan). Around 4:30AM on June 20th, the moon will be in its last phase (last quarter) before the new moon. The moon will be dim and may be hard to find as it is low in the east. But it will be easy to locate because it will be 3 degrees (3 pinkies) to the right of the last blazingly bright planet visible - Venus. This low on the horizon, even Venus suffers some distortions by the thick atmosphere, but because it is very near, large and highly reflective, it really stands out in the sky. The surprise of this planet comes when viewed through large binoculars or small telescope. You will see a very small half-moon shape. Because of its position in its orbit, Venus forms a right angle with the Sun and the Earth and looks a half full moon. The Moon does the same in its orbit with the Sun and the Earth but much, much closer than Venus. Still, Venus is by far the most highly reflective, visible planet in the skies and always a beautiful object to view.

Of course the planets and moon are always changing in their orbits so next month, you get a whole different set of arrangements in the sky.

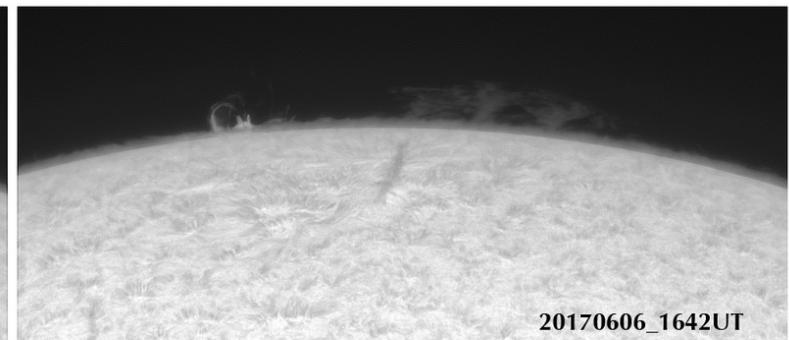
To learn more, join the Popular Astronomy Club which meets the second Monday of the month at 7 P.M. at the John Deere Planetarium at Augustana College or we have free public nights at the Niabi Zoo, every third Saturday night of the month at sunset (weather permitting) from March thru November.



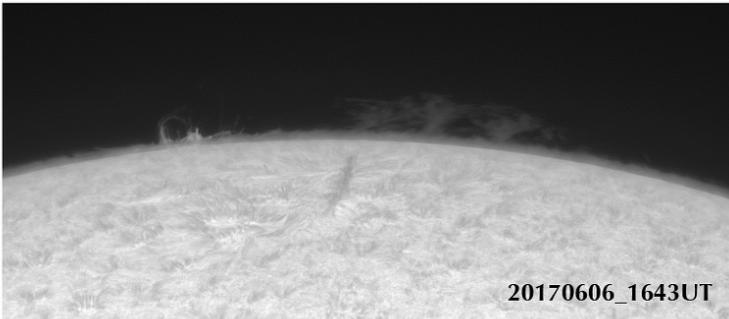
NCRAL STARRY SKIES PHOTO GALLERY



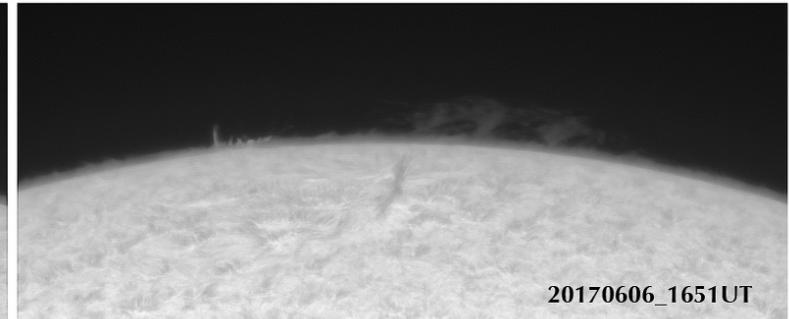
20170606_1641UT



20170606_1642UT



20170606_1643UT



20170606_1651UT

Clockwise from the top: NGC 5907 by Tim Stone, Twin City Amateur Astronomers. Image produced using both a PlaneWave CDK 20" and AG Optical 16" telescopes with an STX16803 camera at the Prairie Skies Observatory near McLean, Illinois; Messier 92 by Jim Gibbs, Twin City Amateur Astronomers. Taken using an Astro-Tech 8" Ritchie Chretien with an SBIG ST-8300-M at the Sugar Grove Nature Center in McLean, Illinois; Jamey Jenkins, Twin City Amateur Astronomers, Prominence activity on the west limb of the Sun. 2017 June 06 with 100mm f14 refractor through a Daystar Quark Chromosphere filter, DMK41 camera.

Editor's Note: Please send any images you wish to be included for this Photo Gallery to jrgibbs@msn.com. Please include the author's name, club affiliation, equipment, date and place where the image was taken. A brief description of the object and/or conditions can also be included.