Northern Lights

North-Central Region of the Astronomical League

Autumn 2016 - Series II , Volume 1, No. 2

RAC TO HOST NCRAL 2017

The Rochester Astronomy Club (RAC) will host the next meeting of the North Central Region of the Astronomical League (NCRAL) April 21-23, 2017. The venue will be Eagle Bluff Environmental Learning Center in rural Lanesboro, Minnesota. The agenda includes opportunities for members to share their passion for astronomy by presenting short "micro talks" or hosting discussion groups on favorite or otherwise personally-compelling topics. Details for submitting proposals for talks and discussion topics will be forthcoming. Please consider giving a talk or hosting a discussion at NCRAL 2017!

http://ncral2017.rochesterskies.org/

Eagle Bluff is also RAC's primary dark-sky observing site. Don't forget to pack your light bucket!

In this edition:

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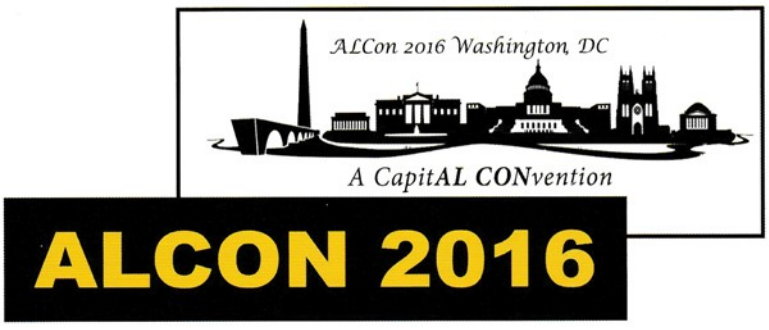
Reports from the Nation's Capital



EDITOR/REGIONAL REP'S MESSAGE

This is issue No. 2 (Series II) of the ***NORTHERN LIGHTS*** newsletter. As you will see by reading this issue, the newsletter has grown in size quite a bit since the inaugural issue last quarter. This expansion has occurred thanks to the willingness of so many amateur astronomers within NCRAL and elsewhere who are willing to contribute information suitable to our NCRAL readers. As editor-in-chief of this publication, I want to acknowledge the contributions of the following NCRAL members to this issue: Jim Gibbs (FVAS/TCAA), Alan Sheidler (PAS), Kirk Severson (RAC), Vince Vella, Jr. (CAA), Jeff Struve (PAS), John Heasley (ICA), and Tim Stone (TCAA), as well as independent authors Jeffrey L. Hunt and Robert C. Victor.

The Autumn 2016 issue of ***NORTHERN LIGHTS*** is filled with numerous articles, many of them conference related. In this issue we are looking both backward and forward – backward to ALCON 2016 and forward to NCRAL 2017. In the former case, I want to draw your attention to Jim Gibb's closing comments about membership attendance at ALCON 2016 in the Washington, DC, area most recently. In the latter case, I want to draw attention to NCRAL 2017. I strongly encourage everyone to attend next spring's gathering outside of Rochester, MN. I'm sure that "Captain Kirk" Severson and the RAC will be putting on an outstanding program, and each of us can make it better by both attending and participating by giving a contributed talk. I heartily encourage everyone to do so.

As always, this newsletter contains important information and serves several purposes:

1. It helps get the word out about events nationally and in the North-Central Region of the Astronomical League.
2. It serves as a benefit of membership to our NCRAL-affiliated clubs.
3. It provides an avenue for members' contributions to be published for readers across the NCRAL region.

The editors of this newsletter hope that it makes its way to ALL members of AL-affiliated clubs in the North-Central Region. ***NORTHERN LIGHTS*** it is disseminated via email through a network of ALCors, club presidents, and newsletter editors. The newsletter is intended for all club members, not just these leaders. So, if you 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 address in my database. If possibly not, feel free to contact me via email with the correct information and I'll see to it that your leaders receive newsletter mailings directly.

I also want to note that as your Regional Representative to the AL Council, you should feel free to contact me with questions or concerns about the national program. I'm now in regular contact with AL President John Jardine Goss and other national officers, and regional chairpersons and representatives.

Lastly, we need to be thinking ahead to electing NCRAL officers at the next business meeting at NCRAL 2017. To the best of my understanding, the positions of Chairperson, Assistant Chairperson, and Secretary/Treasurer will once again be open for two year term.

Carl Wenning, Editor/Regional Rep.

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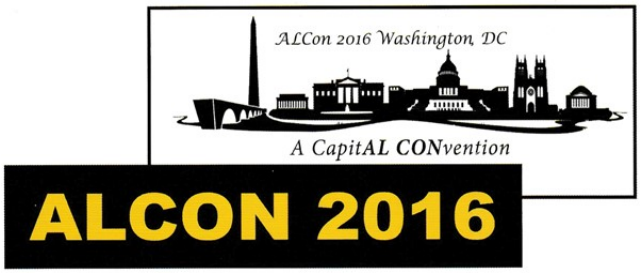
Reports from the Nation's Capital



Report from the Astronomical League National Council Meeting

~ by Carl J. Wenning, NCRAL Representative to the AL ~

NCRAL's newly-elected Section Representative, Carl Wenning (Twin City Amateur Astronomers, Bloomington-Normal, IL), attended the Astronomical League's Council meeting held the day prior to the start of ALCON 2016 in Arlington, Virginia. (For those of you who are new to the AL's governmental structure, the Council consists of 5 officers elected at the national level and the Chairs and Representatives of the AL's 10 sections.) What follows is a brief summary from the Council meeting. Detailed minutes will be provided in the AL's ***Reflector*** newsletter when they become available.

The meeting was called to order at 8:30 AM on Wednesday, August 10th, by President John Goss. Twelve persons were present at the meeting, and the quorum necessary to conduct business was met.

John made brief introductory remarks about the state of the AL. He indicated that the AL continues to grow with some 280 clubs and 16,500 members currently.

Officer reports were next item of business. President Goss noted that this is a great time for the AL, but three items of concern do exist: (1) the aging membership with their changing astronomical desires, (2) the seeming lack of AL membership relevancy for the youth, and (3) little documentation of AL responsibilities, programs, and procedures. Efforts are now underway to address these concerns. John noted results of a new sketching award program.

Vice President Bill Bogardus noted the League's prior approval for including international groups who are mainly interested in participating in the AL's observing programs. Ireland, Israel, and India were allowed to join the International Section. This section will have no voice on Council and no votes in elections.

Secretary Bryan Tobias asked for approval of last year's Council minutes. They were approved without amendment.

Treasurer Tom Lynch was not present at this point so his report was delayed.

Executive Secretary Ron Whitehead spoke briefly about matters of governance and conflict of interest policy. A previously considered draft policy statement was approved and all Council members asked to sign. Ron noted at some length that we need to document procedures for each of the officers despite the fact that the organization is now 73 years old and has yet to do so.

Webmaster Vern Raben noted that there is lots of background work going on with the AL website, and one task is to create access for regions to update their associated web page, update information files, and so forth. President Goss appointed a committee of three to make suggestions about how to upgrade the website. Included among those chosen to serve on the committee was the NCRAL representative.

Reflector Editor Ron Kramer noted that things continue to go well with the publication, and he lauded the fact the so many members are willing to contribute articles and images. He currently has three issues worth of material yet to be published, and suggested that the publication might continue to expand is size. With ***Reflector*** gradually going electronic, we are saving lots of money and this will allow for expansion even while we continue to print hard copy. The publication is the largest single expense the club has, and it nearly rivals the entire cost of maintaining national office in Kansas City with its several part-time workers.

At about this point in the meeting, Treasurer Lynch provided a brief overview of the financial status of the League. It was noted as part of the discussion that ALCON 2016 would be a money loser for the League, but that ASTROCON 2017 should more than make up the difference.

Following a brief break for lunch, Past President Carroll Iorg provided an update on the events of ASTROCON 2017 in Casper, WY, August 16-19. The event is in the path of totality for the August 21st event, and already 747 people are registered as have over 50 vendors. If anyone intends to participate in this event, they need to register NOW and make accommodations. Hotels, lodges, B&Bs and such are already filling and what remains might be 50 miles or more away already. ALCON 2018 will be held in St. Paul, MN, July 11-14, 2018.

Observing programs continue to do exceedingly well and are one of the main attractors associated with League membership. Those who are not in clubs can join the AL as members-at-large (MAL) with voting rights. MAL dues payments prove to be a substantial source of income for the League.

There was a brief discussion about whether or not to allow AL membership for incarcerated individuals. Heretofore there have been no limitations, and it was agreed to refrain from such stipulations. A proposed policy statement was tabled.

Under items of new business, two additional topics were discussed. One proposed program was sent back for further revision being as it appeared to be way too comprehensive in what it was trying to accomplish. A second was approved.

Honorary memberships were approved in the cases of three individuals.

The budget for the coming fiscal year was reviewed and adjusted by small amounts. Bob Gent was re-elected to serve in his capacity as Trustee for the Leagues finances.

The meeting was adjourned just before 5PM.

Report from the ALCON 2016 Main Event

~ by Carl Wenning, Twin City Amateur Astronomers & Alan Sheidler, Popular Astronomy Club ~

Your ***Northern Lights*** newsletter editors and a colleague attended the ALCON 2016 meeting in Arlington, VA, August 10-13. The first day of this event was set aside for the meeting of the Executive Council which took the full day and the substance of which is described in the above article. The remainder of the event focused on meetings, field trips, workshops, and displays. During this event, attendees met people with similar interests who are well versed in outreach, experienced with youth in astronomy, and knowledgeable about the art of observing and the science of astronomy. Please note that what follows is only a brief summary of events as a 3,500-word detailed description with images will appear in an upcoming issue of ***Reflector***.

During the main event spanning Thursday, Friday, and Saturday, the following speakers presented. Here is the day-by-day listing:

Thursday:

Dr. David DeVorkin – Smithsonian National Air & Space Museum, Senior Curator of history of astronomy and the space sciences, *Bringing Astronomy to the Nation's Mall*

Dr. Geneviève de Messières – Smithsonian National Air & Space Museum, *Young Children at Your Telescope*

Kevin Quin – Northern Virginia Astronomy Club, *Astrophotography without Superpowers!*

Gregg Harry – American University LIGO Program, *Gravitational Wave Astronomy*

Michael E. Summers – George Mason University, *The New Horizons Mission to Pluto and Charon*

Thursday evening featured a Star-B-Q in a local park. Unfortunately, the area was under a heat warning with temperatures in the high 90s and heat indices exceeding 100°F. Fortunately, the event was held under the shade of trees and a cooling breeze took the edge off the weather conditions. Those who chose to remain later into the evening were entertained by a musical group.

Friday:

Friday's schedule of speakers included the following.

Dr. Thomas Jones – NASA veteran astronaut, *Ask the Astronaut: A Galaxy of Astonishing Answers to Your Questions on Spaceflight*

Dr. Harold Geller – Associate Professor and Observatory Director at George Mason University, *Forty Years ago we touched the surface of Mars*

Matt Will – ALPO Secretary/Treasurer, *The ALPO: It's Origin, Purpose and Progress*

Dr. Mike Reynolds – ALPO, *Rocks from Space*

Greg Redfern – NASA JPL Solar System Ambassador, *The Chesapeake Bay Impact Crater – A Cosmic Detective Story*

Friday evening constituted free time, and so many took advantage of the opportunity to view local sights, visit with friends and relatives, and to enjoy the many fine dining venues available in the Washington metropolitan area.

Saturday:

Saturday morning began with the *AL Public Business Meeting*. As President John Goss remarked, this should better be named *AL Update* so as to draw a greater attendance from among the conferees. John provided numerous updates that originated from the actions of the Wednesday Council meeting.

Youth talks were presented next:

Jayasuriya Senthilvelan & Swagat Bhattacharyya, *Detection of the Interstellar Molecule OH*

Megan Gialluca, *Radition-Hydrodynamic Outflows and Magnetars' Glitches and Anti-Glitches*

After a short break, the flow of speakers continued:

Dr. Julius Benton – ALPO, *Observing Venus with the ALPO*

Vincent Giovannone – ALPO, *30 years of Perseids Meteor Observing*

Dr. John Westfall– ALPO, *The Aristarchos Experiment*

Dr. Mike Reynolds – ALPO, *46 Years of Total Solar Eclipse Chasing*

Dr. Stella Kafka – Director American Association of Variable Star Observers (AAVSO), *Variable Stars and Their Stories*

These talks were concluded by around 4:00 PM, at which time there was a break allowing everyone to prepare for the evening's Awards Dinner. A "mixer" took place in the hour before the start of the banquet. Following a buffet-style dinner, members paid rapt attention as keynote speaker Maj. Gen. Charles F. Bolden, Jr., Director of NASA, departing from his prepared comments, spoke leisurely about his experiences in space (commander of four shuttle flights, including the insertion of the Hubble Space Telescope into orbit). The presentation became an entertaining and lively discussion with the guests in attendance. Most graciously, General Bolden stayed for another hour as Astronomical League awards were presented.

The closing ceremony began with awards from the Association of Lunar and Planetary Observers. The awards were as follows:

Walter H. Haas Observer Award, Randy Tatum

Peggy Haas Service Award, Jeff Beish

The Astronomical League Awards and recognitions came next and were as follows:

National Young Astronomer Award, 1st Place, Jayasuriya Senthilvelan & Swagat Bhattacharyya

National Young Astronomer Award, 2nd Place, Megan Gialluca

Horkheimer/Smith Youth Service Award, Katherine Melbourne (from NCRAL's Popular Astronomy Club)

Horkheimer/D'Auria Youth Service Award, Virginia Mellott

Horkheimer/Parker Youth Imaging Award, Virginia Mellott

Master Observer Award Recognition (5 individuals including NCRAL's Carl Wenning)

Mabel Sterns Newsletter Editor Award, 1st Place, John Hepler, Chester County Astronomical Society

Mabel Sterns Newsletter Editor Award, 2nd Place, Carl Wenning, Twin City Amateur Astronomers

Mabel Sterns Newsletter Editor Award, 3rd Place, Eric Fischer, Amateur Astronomers Association of Pittsburgh

Leslie C. Peltier Award, Mike Reynolds (NCRAL 2016 speaker)

GR Wright Service Award, outgoing AL Treasurer, Tom Lynch

Popular Astronomy Club member Katie Melbourne, recipient of the Horkheimer/Smith Youth Service Award is congratulated by Astronomical League President John Goss

As if all these activities were not enough, there were a number of workshops presented throughout the main event:

Eclipses and Seasons: Activities and Outreach by Christi Whitworth & Skip Bird on Thursday

Energy from the Sun for Families and Radio Meteor Echoes by Christi Whitworth & Skip Bird on Friday

Solar Flare Detectors by Chip Sufitchi and *Night Sky Network* by Vivian White on Saturday

Add to this list of activities were the five field trips that occurred multiple times during the three days of the main event: Smithsonian Museum of Natural History Meteorite Tour (where participants were allowed to handle such things as meteorites from Mars), NASA Goddard

Space Flight Center (where visitors got the see part of the James Webb Space Telescope being assembled), Smithsonian Udvar-Hazy Center (the nation's premiere aviation museum), Smithsonian Air & Space Museum (on the Mall, near the US Capitol building), and the United States Naval Observatory (and the home of the Vice President of the United States).

All in all, our hosts – the Northern Virginia Astronomy Club (NOVAC) – did a bang up job of hosting this amazing event.

TCAA member Carl Wenning (second from left) receives his Master Observer Award. Also shown are AL Vice President Bill Bogardus (far left) and AL President John Goss (far right).

Carl Wenning, editor of the TCAA's newsletter The OBSERVER, receives the coveted Mabel Sterns Newsletter Editor Award, 2nd Place, and a handshake from AL President John Goss.

Astronomical League CONvention 2016

~ by Jim Gibbs, Fox Valley Astronomical Society / Twin City Amateur Astronomers ~

The 2016 convention of the Astronomical League held in Washington D.C. and hosted by the Northern Virginia Astronomy Club (NOVAC) was a resounding success in terms of how well it was organized and the many sites of interest, guest speakers, and hands-on workshops offered to amateur astronomers in attendance. The event offered five guided tours that were repeated multiple times during the four-day event: Smithsonian Museum of Natural History with the Meteorite Tour, NASA Goddard Space Flight Center, Smithsonian Udvar-Hazy Center, Smithsonian Air and Space Museum and the United States Naval Observatory. The distinguished list of speakers included Dr. David Devorkin, senior curator of History of Astronomy of the Smithsonian National Air & Space Museum; Dr. Genevieve deMessieres, Smithsonian National Air & Space Museum; Kevin Quin, NOVAC Astroimager; Gregg Harry, LOGO program; Mike Summers, Professor of Planetary Sciences and Astronomy at George Mason University; Dr. Thomas Jones, Astronaut; Dr. Harold Geller, Gorge Mason University; Dr. George Doshek, National Research Laboratory; Christi Withworth, Pisgah Astronomical Research Institute; Ciprian Sufitchi, Radio Meteor Echoes; Matt Will, ALPO; Dr. Mike Reynolds, ALPO; Greg Redfern, JPL solar ambassador; Dr. Julius Benton, ALPO; Vivian White, NASA Night Sky Network; Vincent Giovannone, ALPO; Dr. John Westfall, ALPO; Dr. Stella Kafka, Director of the American Association of Variable Star Observers and the keynote special guest for the banquet Major General Charles F. Bolden, Jr, NASA Administrator.

Needless to say, the activities and speakers were very interesting and you will find several articles covering those in various publications such as ***Reflector*** and ***Northern Lights*** newsletters. I enjoyed attending ALCON 2016 and wanted to offer my opinion from a different point of view about the factors that made this a great experience for me.

NOVAC – The host, the Northern Virginia Astronomy Club, did an excellent job in planning and executing ALCON. The members of NOVAC, from the president Terry Cabell and the other members helping on a daily basis couldn't have been nicer and always went out of their way to help. The members serving as chaperone of the tours were very knowledgeable and knew their way to summon the right resources within the different tour sites in order to get a tour guide to enhance the experience. Anytime anybody had an issue or question, a NOVAC member was around to help. Job well done NOVAC.

Tours – Unless you are a frequent visitor of Washington, DC, it is regretful to visit our nation's capital and not visit any of the monuments, cultural centers, museums, etc. ALCON 2016 gave the attendees the opportunity to visit several of these sites. I personally missed going to the NASA Goddard Space Flight Center and the US Naval Observatory which I wanted to visit (hopefully next time I am in town), the comments I heard from others were all positive not just with the site itself but the experience with the ALCON group. Nonetheless, I was able to visit the Smithsonian Udvar-Hazy center. The tour guide who accompanied us was a retired US Army flight engineer, I really enjoyed listening to him talk about the story of the 5 planes he showed us in detail. Of course, the place is packed with all kinds of planes from the Wright brothers to the Space Shuttle. The highlight for me was seeing the SR-71, the Concorde, and the Space Shuttle Discovery. With this visit, I have now seen all three remaining Space Shuttles: The Endeavor, in Los Angeles, California, and Atlantis in Cape Canaveral, Florida. The highlight of the Smithsonian Air & Space was actually outside the museum in the little observatory dome next to the building where the charming attendant, Shauna Edson, explained to us about the various programs

From upper left to lower right: Gen. Charles Bolden, Wright Brothers flyer recreation, SR-71 Blackbird, and NASM Observatory

and star parties they host in the DC area. She also showed us a wood Sunspotter which is a low tech and safe way to teach children about Sun observing and explained about the upcoming eclipse next year. Another exhibit of interest that is worth mentioning was the Wright Bother's first flight and plane exhibition. We only had 2 hours to visit the site, definitely not enough time to see all exhibits in detail but enough to get an appreciation for the place. I was not able to see everything and much less read the captions but it was a great experience. Also the interaction with the other ALCON attendees was a great way to learn about other amateur astronomers.

Speakers – The superb program put together by NOVAC and AL was only limited by time. Depending who you ask, some would say "I would have liked more about "Astroimaging" or "more about solar system and deep space science" or "more about the Mars missions", etc. The truth is that the program was well balance and had something for everyone. The one thing we all agreed to is that the keynote given by General Charles Bolden was great. He decided to deviate from the prepared notes and made his presentation interactive by answering questions. My impression is that in the answers he gave, he was still able to convey a good message that included NASA's vision for the future, the current and upcoming missions, the commercialization and privatization of some aspects of what up to this point is been only a government enterprise among others. General Bolden came through as a sincere leader with a vision for the future and encouraged all of us to be ambassadors for science and engineering to inspire the next generation to pursue a career in any of these fields as the need for highly technical professions and scientist will be essential to the success of this vision.

Awards – Congratulations to all the recipients of awards and in particular NCRAL's own Carl Wenning who was awarded the Master Observer and second place of the Mabel Sterns Newsletter Editor Award. These are well deserved. The recipients of the Youth Awards were of special interest. It was good to learn how these young future scientists applied themselves in their chosen scientific fields of interest. Each of them had the opportunity to speak about their work and research earlier in the day. All of them were very eloquent, articulate and knowledgeable. (See page 23 of the current issue of ***Reflector*** for more details on the Youth Awards 2016.) Special congratulations to Katie Melbourne of NCRAL's Popular Astronomy Club from the Quad Cities, more specifically Rock Island, IL.

Attendance – Analogous to the NCRAL 2016 earlier in the year in Normal, IL, and hosted by the TCAA; ALCON 2016 experienced low attendance in my opinion, considering these are regional and national events. Carl reported that around 200-225 people signed up and with less participation in various events as the tours, speakers and hands on ran concurrently. Another interesting observation is that almost half of the attendees were there because they were speakers, family supporting an awardee, a vendor or sponsor and members of NOVAC, this leaves a very small group of people that actually were there as participants. The costs associated with travel, accommodations and the inability to commit a week are probably the main factors that prevents most from attending.

One of the most enjoyable aspects of any type of conference is to mingle around with people from other places and exchange experiences. The StarBQ, was a perfect example where the members in attendance enjoyed a BBQ meal, live music and the opportunity to visit with other amateur astronomers in a different setting.

Evening Planets in School Year 2016-17

*by Robert C. Victor**

Venus will dramatically improve in visibility in late 2016, as the fast-moving inner planet gains on Earth and moves farther away from its *superior conjunction* beyond the Sun on June 6. By mid-September 2016, Venus sets about one hour after sunset. By early November, Venus improves in visibility, setting two hours after sunset, and will be noticed in a fully darkened sky before it sets. In early December 2016, Venus will set a full three hours after sunset. On January 12, 2017, Venus will reach *greatest elongation,* 47° east (upper left) of the setting Sun, and will set four hours after sundown. Around then, Venus will be of increasing interest for viewing through a telescope, as the planet will display a tiny "half-moon" shape, even at low magnification. February and March will be even better! As Venus swings closer to Earth, it will grow rapidly in apparent size and display ever thinner crescent phases while the planet becomes more backlighted by the Sun. Greatest brilliance at mag. –4.8 occurs in mid-February 2017. Even slight optical aid such as binoculars will then reveal a crescent about one-quarter full, easy to observe in daylight or in bright twilight. *Inferior conjunction* (Venus nearly between Earth and Sun) will occur on March 25. On this occasion, Venus passes over 8° north of the Sun, so it will be possible to observe the very thin crescent Venus both after sunset and before sunrise for a few days (and even in the daytime if proper precautions are taken) as the planet shifts into the eastern morning sky.

Jupiter disappears into the bright evening twilight glow by early September 2016. After passing *conjunction* beyond the Sun on Sept. 25, Jupiter reappears low in the eastern morning twilight glow about 15 days later. During Oct. 10-12, emerging Jupiter climbs past departing Mercury, at the end of the inner planet's brief but favorable morning apparition. With each passing month, Jupiter rises earlier in the night, until on April 7, 2017 it will be at *opposition,* rising around sunset and visible all night. After opposition, in spring and summer of 2017, Jupiter will be a prominent object in the evening sky in the constellation Virgo, not far from the star Spica. Through a telescope, Jupiter's two dark equatorial cloud belts and its four satellites discovered by Galileo are prime attractions.

Saturn is still visible in the evening sky in September 2016, lingering only 6° from the reddish first-magnitude star Antares, heart of the Scorpion. If you want students to have good telescopic views of the rings, be sure to schedule a viewing session early in this school year, while Saturn is still fairly high. By early in November, Saturn will set before twilight ends, and around Thanksgiving, it departs. Saturn passes *conjunction* with the Sun on December 10, and by New Year's Day 2017, it emerges low in the southeastern morning twilight. The ringed planet then rises nearly two hours earlier per month. Saturn fans will have to wait until mid-June 2017 for Saturn to reach *opposition,* when it will rise around sunset and again become available for early evening observation.

Mars in late May 2016 presented earthbound viewers with a fine *opposition* and a closest approach. Mars then appeared at magnitude –2.1, slightly brighter than Jupiter at the time. Mars remains in the evening sky for nearly all of school year 2016-2017, but fades as our faster-moving Earth leaves it behind. Mars is still a bit brighter than zero magnitude in south-southwest at dusk in early September 2016; it slightly out-

shines Arcturus and Vega, the brightest stars then visible. Mars fades to mag. +1.0 by mid-January 2017, when it's in the southwest at dusk, a few degrees upper left of brilliant Venus. For a few evenings around April 21, 2017, Mars passes within 4° south of the Pleiades star cluster low in west to west-northwest, and glows dimly at mag. +1.6, about as bright as Castor, the fainter of the Gemini twins. Mars passes 6° north (upper right) of brighter, sinking Aldebaran, eye of Taurus, on May 5, 2017. About a week later, Mars sets as twilight ends. Binoculars may help follow Mars sinking into ever brighter twilight glow until early June. Mars is in *conjunction* with the Sun on July 26, 2017. By early in September 2017, dim Mars at mag. +1.8 begins to emerge into the eastern morning twilight glow. On the night of July 26, 2018, Earth will overtake Mars, and the red planet will be at *opposition,* in the sky nearly all night, gleaming at mag. –2.8. Closest approach, within 36 million miles of Earth, occurs four nights later.

Mercury: This innermost planet's first evening appearance of the 2016-2017 school year lasts from late November through mid-December 2016 is rather unfavorable. Mercury lingers 24° lower right of Venus during Dec. 2-12. The apparition begins as Mercury (mag. –0.5) replaces recently departed Saturn (+0.5) after Thanksgiving weekend. It remains very low in bright twilight in SW to WSW; use binoculars. Mercury is still of mag. –0.5 when it reaches greatest elongation, 21° from Sun on Dec. 10, and almost as bright when at peak altitude a few days later. Mercury dims to mag. 0.0 by Dec. 17 and fades very sharply thereafter. Mercury begins its best evening appearance of the 2016-17 school year by March 18, 2017, when the emerging planet shines at mag. –1.3 and appears within 9° left of departing Venus. Mercury climbs to peak altitude in evening twilight on March 31, still bright at mag. –0.2, and at greatest elongation, 19° almost directly above the Sun. This is a very favorable apparition, making Mercury very easy for unaided eye. During April 1-4, Mercury pauses 15° lower right of fainter Mars (+1.5). By April 6, Mercury fades to mag. +1.0. Mercury fades very quickly after that, and within a very few days can no longer be seen. The reason for the rapid fading is that in the planet's crescent phases, features on its rough surface cast shadows, decreasing the brightness of the illuminated area. Cloud-covered Venus does not suffer such an effect; in fact, Venus appears brightest when it's a crescent about one-fourth illuminated, about five weeks before and after inferior conjunction.

Planet gatherings and pairings. Venus, Saturn, and Antares will form beautiful gatherings low in the southwest at dusk during Oct. 26-29. Use binoculars to see Antares. For nearly seven weeks, Jan. 7-Feb. 23, 2017, brilliant Venus lingers within 10° lower right of faint red Mars. For eight evenings, Jan. 29-Feb. 5, Venus lingers within 5.5° west of Mars; Venus will not overtake the red planet, but instead will pull away from Mars in February and March, as Venus swings toward inferior conjunction, between Earth and Sun.

The Moon is found near one or more planets in the evening sky on these dates in late 2016: Sept. 2, 3, 8, 9, Oct. 3, 5, 7, 8, Nov. 2, 5, 6, 30, Dec. 2, 3, 4, 5. In the first half of 2017, look for evening Moon-planet pairings on Jan. 1, 2, 31, Feb. 28, Mar. 1, 14 (late evening), 28, 29, 30, Apr. 10, 27, May 7, 26, June 3, 9, 30.

These events and many others will be illustrated on the Abrams Planetarium ***Sky Calendar.*** For information on how to subscribe, visit www.abramsplanetarium.org/skycalendar/

** Robert C. Victor was Staff Astronomer at Abrams Planetarium, Michigan State University. He is now retired and enjoys providing skywatching opportunities for school children in East Lansing, MI and in and around Palm Springs, CA. Reprinted with permission of the author.*

facebook

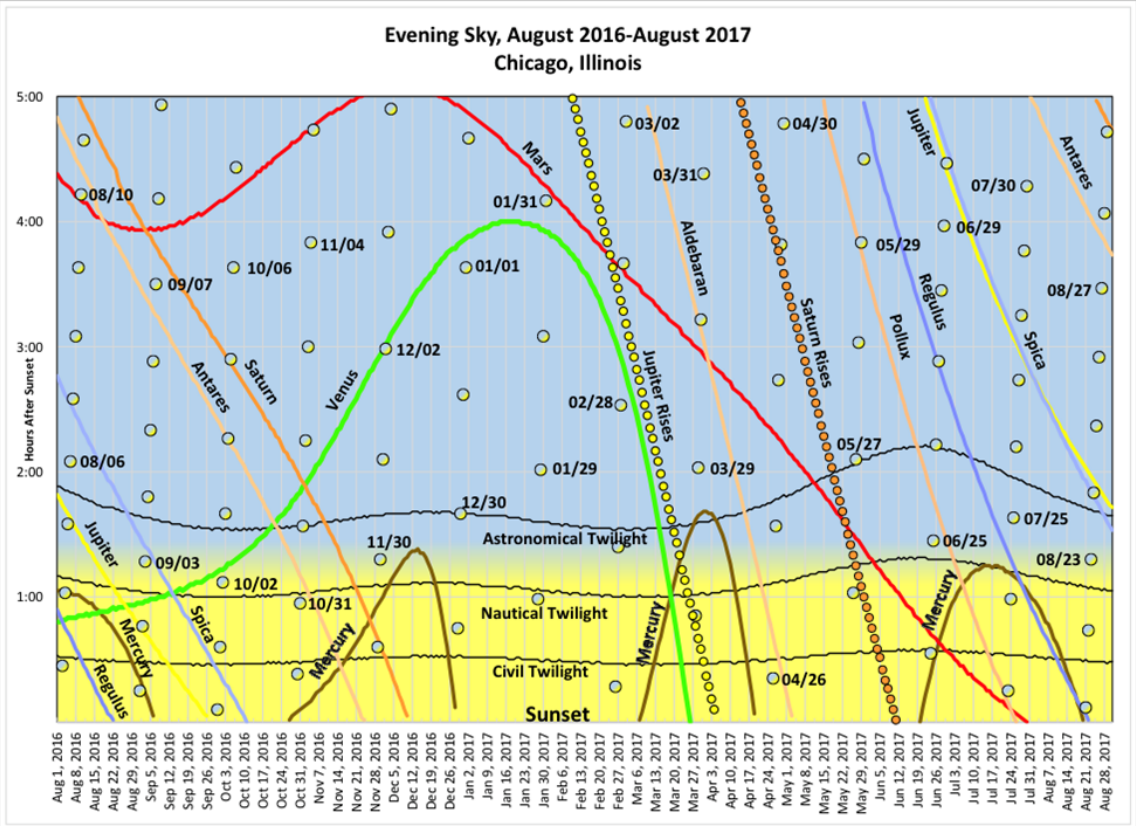
NCRAL Now on Facebook

Did you know that NCRAL now has a Facebook page for sharing information about your Region's AL-affiliated clubs? This feature was added following the NCRAL 2016 meeting when the number of "hits" on the meeting's Facebook site did not subside as would have been anticipated follow the end of the meeting. It was as through people were searching for NCRAL information and were not finding what they wanted. Hopefully users can now find what they are looking for, and others are free to post images and messages to this un-moderated group. You may now like us and follow NCRAL on Facebook at:

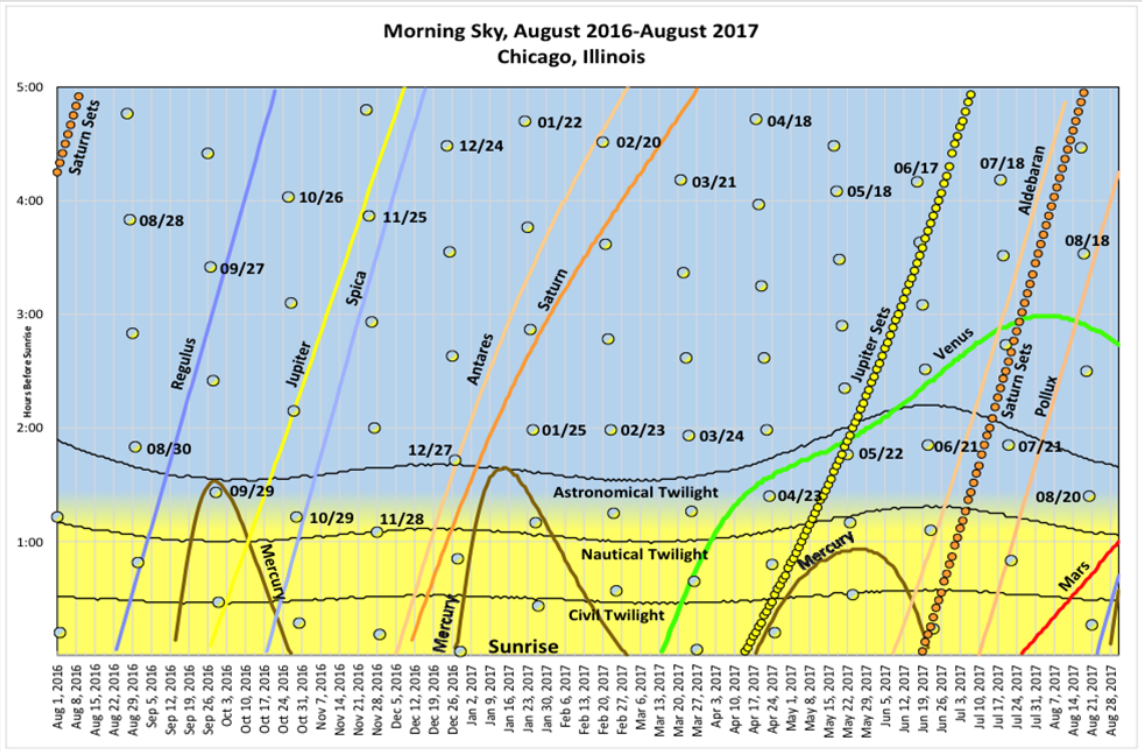
https://www.facebook.com/northcentralregionastronomicalleague/

Charts Showing Rise and Set times Relative to the Sun for the 2016-17 School Year

For those of you with crepuscular interests and then some, you will find the following two charts of great interest. Prepared by former planetarium director Dr. Jeffrey L. Hunt of Naperville, IL, these charts show the times of rising and setting of selected celestial objects relative to sunrise and sunset weekly intervals throughout the coming year. The calculations are based on the latitude of Chicago, but are useful throughout the NCRAL area. Used with permission.



All moon dots, and the curves for planets and stars, indicate setting times in relation to sunset, except for the two planet curves labeled to indicate times of rising, also in relation to sunset.



All moon dots, and the curves for planets and stars, indicate rising times in relation to sunrise, except for the three planet curves labeled to indicate times of setting, also in relation to sunrise.

NCRAL Website

~ by Jeff Setzer ~

Did you know that NCRAL has it's 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

Big Changes in the Astronomical League Website

If you haven't visited the AL website recently, you will be in for a big surprise. There have been some major changes. One of the first things that draws attention is the new layout. The home page has some feature stories, and there are readily visible links to sponsors and the latest issues of Reflector. Also on the home page is a list of upcoming events.

The horizontal navigation tool bar is functional, but is still a work in progress. A quick search of NCRAL clubs in my state shows that some of the information is incomplete and some not up to date. The expectations are that clubs will soon be able to update their own contact information. It seems to be easier now to contact our national officers as well.

The links to the region are in a state of informational disarray. For instance, the NCRAL page seems not to have been updated since 1998. The information about officers is better than before as it was updated after the NCRAL 2016 elections in Normal. Still, it is incorrect despite an effort to correct misinformation.

The AL store still has a 1990s look about it, but I understand that this operation and its webpage are managed by different individuals. Hopefully, this web page will be updated before long as well. Updating the AL website is a Herculean task, and the effort is ongoing. From what was heard at the national council meeting, a better site still is coming.

Call for NCRAL Officer Nominations

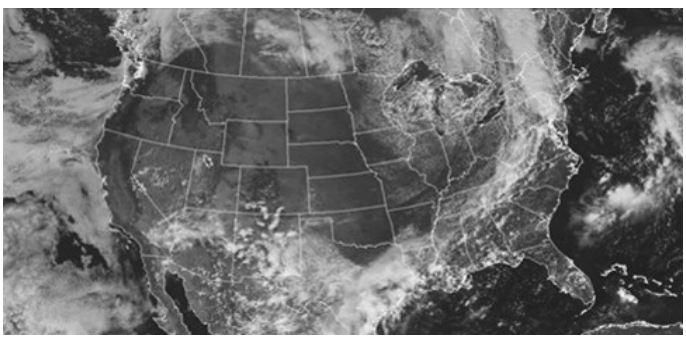
According to the Astronomical League constitution, each Region is to be led by a Chairperson, Vice Chairperson, Secretary and Treasurer or Secretary/Treasurer. According to the constitution, "They shall be elected by the members present at the Regional Convention, or if none is held, by the Regional Council, for terms of not more than two (2) years. The Regional officers shall be empowered to act on behalf of the Regional Council, and with its full authority, on matters, other than the election of Regional officers, which require its attention when the Regional Council is unable to meet." (Article IX. Regions and Regional Activities, Section 3.)

NCRAL officer elections historically have been held at regional meetings during odd-numbered calendar years. We would have held such an election at NCRAL 2015 in Fargo, ND, but that meeting was cancelled. During the NCRAL 2016 meeting in Normal, IL, existing officers agreed to carry on in their current positions for one more year until new elections can be held at the NCRAL 2017 meeting.

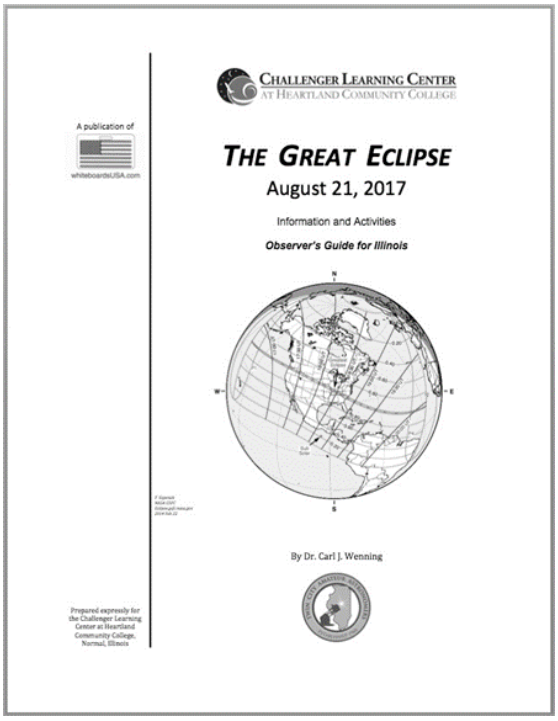
We are now seeking nominations for the positions of chairperson, vice chairperson, secretary/treasurer, and possibly regional representative. Should you wish to nominate yourself or others, please email your nomination to NCRAL Secretary/Treasurer Don Klemt at donklemt@ameritech.net.

Eclipse Day Weather One Year Out

August 21st began the one-year countdown for the 2017 total solar eclipse here in Illinois. The weather for that day was suggestive – not indicative – of what we might see during this eclipse. The images here show the sky over the Midwest and nationally. An eye to southern Illinois shows that it was essentially cloudless on that day. The sky from Bloomington was still "passable" for viewing a total solar eclipse, but a passing cloud could easily have blotted out totality. This image was provided courtesy of Carl Wenning (TCAA), and the satellite image shown below was provided courtesy of Dan Joyce (CAS).



Challenger Learning Center of Central Illinois to Publish 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 in order 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. The first set of booklets will go to press around September 15th, with delivery to the purchaser anticipated by October 15th. Guides MUST be ordered in multiples of 20 only. Guides will be available in exchange for a donation of $5.25 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 by September 15th:

Challenger Learning Center
Attn: Stacey Shrewsbury
Heartland Community College
1500 West Raab Road
Normal, IL 61761-9446

(Continued from page 14)

summer. There are additional Dobsonians, refractors, and Cassegrains both mounted and portable inside a separate "CAA Member's Roll Off Roof" building adjacent to the main Observatory and Learning Center. These are open to the public during the aforementioned events, and accessible to CAA members at all times.

Additional events and attractions include Solar Viewing, Interactive Displays, occasional off-site outreach events, and an indoor (read: not weather dependent!) station demonstrating the diffractive properties of light with several arc-discharge tubes, gratings, prisms, etc. for experimentation. The facility is located at 1365 Ivanhoe Rd, near Mt. Vernon, IA. Schedules of events, contact information, and club news can be found at cedar-astronomers.org and on the Cedar Amateur Astronomers Facebook page.

The 24 inch "B&C"
(Credit: Lynn Reihman)

Driftless Dark Skies: Home in the Milky Way

~ by John Heasley, Iowa County Astronomers ~

"Why should I feel lonely? Is not our planet in the Milky Way?"
Henry David Thoreau, Walden

Look up into the autumn sky and you will see our Milky Way flowing across. It starts in the northeast where you find Perseus the Hero, now safe from the gorgon and sea monster; passes through Cassiopeia the Queen, Perseus's mother-in-law; flows high overhead where Cygnus the Swan and Aquila the Eagle are flying and Delphinus the Dolphin jumps out of the stream; and arches down to the southwest where Sagittarius, the centaur, still shoots his arrows. It helps to see Sagittarius as a teapot with handle, lid, and spout. Look just above where the tea is pouring and you will be looking into the center of our galaxy. Look just to the right to find ruddy Mars and creamy Saturn, bright planets shining in the Milky Way just as Thoreau reminded us.

Perseus, Cassiopeia, Cygnus, Aquila, Delphinus, and Sagittarius are constellations, patterns of bright stars created by the people of the Fertile Crescent and Mediterranean. Other people on our planet pictured "dark constellations" in the Great Rift of the Milky Way where the stars are hidden by dust clouds. The Incas of South American saw llamas and serpents. The Aborigines of Australia found an emu.

For millennia, humans could only see thousands of stars, even under the darkest of skies. The Milky Way appeared cloudy. Then in 1610, Galileo turned his telescope to the Milky Way and discovered that the nebulosity was actually millions of stars never before imagined. In Siderius Nuncius (Starry Messenger) he shares the awe and wonder that comes from resolving the nature of the Milky Way and discovering that "the galaxy is, in fact, nothing but congeries of innumerable stars."

Now we know that there are hundreds of billions of stars in our galaxy and that it is just one of the hundreds of billions of galaxies in our cosmos. The beauty of the Scientific Revolution is that you don't need to trust Galileo. You can see it for yourself. While most people now live in places where they cannot see our Milky Way because of light pollution, there are still places in the north central states where we can.

Find a dark spot on a clear, moon-free night away from the lights of town. Make yourself comfortable in a reclining chair or lying on a blanket. Scan the Milky Way with binoculars and see the millions of stars. Create your own constellations, find your own animals in the dark rifts, and make your myths. Be at home in our Milky Way.

Every star we see in the night sky is part of our galaxy. We are in the Milky Way, so we can never see it all at once, just as we can never see a forest for the trees. Imagine the Milky Way as a Frisbee. When we see it streaming across the sky, we are looking into the central disk where the stars are so numerous and distant that they flow together. When we look in other directions, we are looking out of the disk and can more easily see the individual stars in our neighborhood.

One of my favorite places to enjoy the Milky Way is at the Kickapoo Valley Reserve, 8569 acres of public property in the Driftless Region of WI, MN, IA, and IL co-managed by a citizen board on behalf of the Ho-Chunk Nation and State of Wisconsin. Like many places in the Driftless Area, it has dark skies and limited light pollution. Yet, I observe there with a sense of nostalgia. You can feel the homesickness and yearning to regain what has been lost. I visit the rock shelters and remember that this was home to the Ho-Chunk and others before they were displaced by European arrivals. I look at the names on the wall of the Visitor Center and remember the families who lost their homes to make way for a dam project in the 1960s. I see a little sky glow from La Farge and Ontario and remember that people in urban areas can no longer see our home galaxy, the Milky Way.

But with the nostalgia comes hope. The Ho-Chunk Nation is now able to protect and share their home on the Reserve. Many of the displaced farm families are now active in preserving and educating others about their former home. KVR staff and educators are working to protect and let visitors enjoy the dark skies. As we move into autumn, I think of it as a homecoming. Welcome home to our Milky Way.

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.

Photo of Milky Way streaming over the Wisconsin River at Lone Rock is courtesy of Driftless Hills Photography. Thanks, Josh! Give his page a like for more amazing photos

Look! Up in the sky! It's a...???

~ Jeff Struve, Popular Astronomy Club ~

So it's nearing sunrise… sunset… the middle of the night… or most anytime, and you notice something up in the sky that for some reason has caught your eye, but what is it? So before calling Mulder and Scully, I thought I would give you a brief overview of the common objects noticed… those of an identified nature of course!

Is the object stationary? If so, you more than likely are seeing a star or planet. Common to notice are the planets Venus and Jupiter… and sometimes Mars and Saturn. Venus is very commonly seen at sun rise and sunset and is commonly referred to as the 'Morning Star' or 'Evening Star'. Jupiter is generally seen when skies are slightly darker and appears a bit larger. Mars is a bit harder to pick out and has a red hue to it. Both Mars and Saturn are generally seen with the aid of darker skies. It is beneficial to view the planets under dark skies, but the ones mentioned here can easily be seen under moonlight skies and even from inside our city limits. During the middle of September, you'll be able to see Jupiter and Venus follow the Sun as they set in the West after 7:00 PM and as skies darken, you'll see Mars and Saturn toward the West.

It seems obvious to mention stars as we generally equate stars with the night sky. There are a number of very bright and large ones to note. Some of the most popular are Sirius, Arcturus, Vega, Capella, Rigel, and Betelgeuse. Don't say that 3 times though!

Other somewhat stationary objects include comets and a few deep space objects that can be slightly visible to the naked eye… primarily the Andromeda Galaxy which would appear as a smudge in the sky and a few star clusters such as the Pleiades which can appear anywhere from a smudge to a small, very close grouping of stars. Less common and therefore highly publicized are the appearances of comets. Comets look a lot like stars with a cloud around them causing them to appear tear drop shaped or with tails.

But you say it's moving? The first thing to note is whether or not it is flashing… not twinkling as stars do, but the light is pulsating. If so, you probably have an airplane of sorts. If it isn't flashing, you could be seeing a meteor or a satellite... but which is it???

A meteor is an object that is burning up as it passes through the atmosphere, therefore is short lived… you see a little flash of light out of the corner of your eye, and then it's gone. It is not uncommon to see them last 10 to 15 seconds, especially during meteor showers. Astrophotographers often capture the paths of meteors and satellites as they photograph objects. A white line that goes from edge to edge of the picture would indicate a satellite or the International Space Station (ISS) as lights from these types of objects do not normally flash. An airplane path, as you may have guessed would look like a dotted line. A meteor generally appears as a short streak in the picture as the camera captures its entry into the atmosphere and its abrupt burnout.

So hopefully I have left you with a few questions… ok, it's probably not ET, but what is it? You also may be wondering if you can see satellites and the ISS during the day…

Thanks to the advent of computers and the smart phone, there are a lot of free programs and apps that can help you precisely identify what you are looking at just by aiming your smart phone at the object. A few of the apps that can help identify stars, planets, comets and other deep sky objects include Google Sky Map, Stellarium, Mobile Observatory, SkEye, Distant Suns, and SkySafari. If you want to see a satellite or the International Space Station, there are apps to help with that as well… they can let you know where and when to look, again by using your smart phone. The apps I use for this include Satellite Safari and ISS Detector.

Clear Skies!

The Eastern Iowa Observatory and Learning Center

A unique observatory operated by the Cedar Amateur Astronomers

~ Vince Vella, Jr., Cedar Amateur Astronomers ~

The Cedar Amateur Astronomers (CAA) operates the "Eastern Iowa Observatory and Learning Center" in a partnership with the Linn County (IA) Conservation Department. The facility, opened in 2008, is located on the public Palisade-Dows Preserve at a location roughly a half-dozen miles east of the mid-point of a line drawn on the map between Cedar Rapids and Iowa City.

The facility, incorporating multiple classroom spaces and observatory domes, internally hosts a number of very unique optical telescopes, each of which was donated to the CAA from the University of Iowa. The first is a (Boller & Chivens) 0.61m Cassegrain that belonged to Professor Van Allen's research group. This polar mounted 2-ton instrument still tracks objects effortlessly without error with all original equipment.

In addition, the University has recently donated an automated (Iowa Built OMI) 0.37m Cassegrain that the CAA is in the process of installing. Lastly, there is a very early 60's era (Celestron) 16" Cassegrain in a stand-alone dome near the main building. (And yes, its OTA is powdered blue!)

The EIOLC hosts over 3,000 visitors per year. In addition to 12+ annual stargazing events accompanied by formal presentations, the

The Eastern Iowa Observatory and Learning Center

CAA also hosts privately arranged tours, member evenings, and informal public viewing through the telescopes every Saturday in the

(Continued on page 12)

The Snake and Her Eggs

~ by Tim Stone, Twin City Amateur Astronomers ~

While on staff at Yerkes Observatory, Williams Bay, Wisconsin, the famed observational astronomer E. E. Barnard undertook a program of photographing much of the Milky Way. Much of this photography was completed in 1905 at Mount Wilson Observatory at the invitation of George Ellery Hale, former director of the Yerkes Observatory. Barnard's purpose for this gargantuan effort was to understand the mysterious places in the sky where stars seemed to be absent, which apparently congregated near the galactic plane. At that time, there was doubt as to whether or not these apparent holes were actually dark obscuring matter, or regions of space where stars simply were not present. By 1913 he had definitively proven that at least some of these dark areas were indeed obscuring matter. He did hold out the strong possibility that some of them were actual voids in the population of stars, as his proof was demonstrated by the phenomenon of "partial obscuration." Where there simply were no visible stars, even in photographic plates exposed for many hours, he believed it possible that there just weren't any stars in those locations.

Of course, we now know that all of these "holes in the heavens" are indeed clouds of obscuring dust, and Barnard's atlas of these places remains one of the finest works in the history of observational astronomy. We are fortunate to have online access to this atlas, along with his notes about the regions he included.

Some of the objects Barnard cataloged are truly remarkable in their form or degree of obscuration. One such object, number 72 in his atlas, is remarkable for both reasons. It is very deeply obscuring, with places where no stars are visible, even in photographs with limiting magnitudes of 18 or fainter. But the characteristic for which it is known is its sinuous S-shaped curves. It is this shape that grants its name of "The Snake Nebula." Of this object, Barnard wrote:

> *"S-shaped. This is a striking object. It is a thin, curved black marking, the exact form of the letter S or the figure 5, as the imagination or point of view may dictate. The southeast branch runs east for some distance passing close south of the star CD-23°13375 (9.1 mag). Its average thickness is about 2' - 3'. The position in the catalogue is for the southern part of the figure, or the bottom of the S (see Astrophysical Journal, 49, 1919, Plate III)."*

The Snake Nebula is in the northern part of a very large cloud of dust, part of which is known as "The Pipe Nebula" for its resemblance to a tobacco pipe. It is accompanied by several dark blobs, Barnard 68, 69, 70, and 71. These small blobs are roughly in a line, and seem to originate with one end of the Snake Nebula. If the S-shaped curve is a snake, then the dark blobs might be her eggs. Together, they are often referred to as "The Snake and Her Eggs."

The star field behind this nebula is astonishingly rich, being only seven degrees north of the plane of the Milky Way galaxy. Most of these stars are doubtless many thousands of light years distant. Over those distances, stars seem to crowd together, much like atmospheric haze seems thicker the farther away you look. This field also contains the small but bright planetary nebula NGC 6369, as well as brilliant blue 44 Oph, a variable star some 800 light years distant.

This image was acquired by Tim Stone with the Twin City Amateur Astronomers' Takahashi CCA250, in the Prairie Sky Observatory at Sugar Grove Nature Center, Funk's Grove, Illinois, on July 2, 2016. It shows the 2.3x2.3-degree area around Barnard 72. It is composed of red, green and blue images, each created from six 300-second exposures.