CELESTIAL LOG

September 2015

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INPUT DEADLINE for October is September 18

NEXT MEETINGS

AUGUST 28, Friday at 7:30 p.m. Willow Recreation Center
3600 Lexington Drive at Algonquin Road, Hoffman Estates
Michelle Nichols of the Adler Planetarium will present "Apollo Mission." The Apollo Mission was a watershed event in the history of rocketry, space exploration, of the USA and, indeed, all mankind. In this talk Ms. Nichols will explore this historic achievement including the background, the major events of the program, and the implications for both science and space exploration then and now.

SEPTEMBER 25, Friday at 7:30 p.m. Willow Recreation Center

Joe Ulowetz of the Skokie Valley Astronomers will present "Building Your Own Observatory." Every astronomer has felt the urge to build an observatory, no matter how grand or modest. Our speaker will relate the trials and tribulations of doing this based on his own, sometimes humorous, experience with building his own Temple to the Stars.

The URL to access our home page: **http://www.nsaclub.org**
NSA private features are on Yahoo groups, to join the club's Yahoo discussion group:
visit http://groups.yahoo.com/neo/groups/NSAClub/info
Facebook: https://www.facebook.com/nsaclub.org

Thanks to President Mel Robinson for his editorial remarks and observing notes, Jim Ammeson for the minutes of the July 31, 2015 meeting, Ryan Kyle for the observing schedule, and Alan Birkner for the August 23, 2015 Treasurer's report. NASA provides the monthly feature.

Wildcat Mountain was fabulous this year despite a mixup with the group site reservation. Plan on **July 29 to August 8, 2016** for next year's event. We have written a brief article and provided a few photos from this year's Wildcat week. Fourteen of us were rewarded with a beautiful aurora on the final night.

After the meeting, the club will return to Rosati's at 1770 W. Wise Road, Schaumburg, IL 60193, phone 847-891-5151.

See you Friday, Edith

Northwest Suburban Astronomers is a not-for-profit corporation chartered by the State of Illinois "to cultivate, foster and promote interest and participation in astronomy."

FROM OUR PRESIDENT … *Mel Robinson*

The 2015 Wildcat Week goes into the books as one of the more unusual Wildcats. It began with a call to the park to ask if early arrivals would be able to use the group site. We learned that the group camping site that has been the site used by the club for every Wildcat Week since the beginning was not only not available for early arrivers, it was not available at all. So began a scramble by park staff and by astronomy club members to find a way to save Wildcat Week.

The staff of Wildcat Mountain State Park went out of their way to find an alternate site for us. They offered to mow a field that was part of their orienteering course so that we could use it for our telescopes and for camping. The staff not only mowed the field several times to turn it from tall prairie plants into a usable observing field, but then also moved picnic tables onto the field and made available a park building if we needed an inside space.

It turns out that the alternate field is on a knoll across from the amphitheater. A weather station had been the only structure on the knoll until it became the temporary home for our telescopes. By the night of the public on the first Saturday of Wildcat Week, the top of the hill had a group of 18 telescopes of all sizes and shapes. Camper trailers and tents were set up around the cluster of telescopes, and food was being prepared for the potluck dinner. After all, an astronomer's gotta eat if they are going to stay up late.

We gathered at a group of picnic tables near the weather station and had an open-air potluck dinner that included a wide variety of wonderful foods - and, yes, a couple of pizzas too. After the dinner, we prepared the telescopes for the public even though clouds had been the main sky feature for most of the day.

The public night began with a program at the amphitheater. A couple of park rangers helped corral the crowd into the amphitheater, which was filled to overflowing, with campers bringing extra chairs and standing along the back. The club screen was set up on the stage and the projector readied, and the program began with an introduction by a park ranger. This year, the program was Near Sky – Far Sky, taking the viewer on a journey from the closest objects in the night sky, through the atmosphere and solar system, to neighboring stars, the structure of our galaxy, the galactic neighborhood, and finally to the limits of the detectable universe. The talk concluded with several thoughtful questions from the audience.

By the end of the talk, the clouds had cleared, and the public was invited to cross the road to the top of the hill for a look through the telescopes. A substantial crowd was treated to spectacular views through our telescopes while knowledgeable club members explained everything from how to focus a telescope to how the universe was made.

Wildcat Week continued with many clear nights. 120 Perseid meteors were observed by club members at the peak of this annual meteor shower. Campers staying in the park were invited to bring lawn chairs to the observing field to share in the meteor observations with us. As the week ended with a new Moon weekend, a colorful Aurora Borealis display illuminated the northern portion of the sky from the treeless hill top that was our temporary observing home. A glorious end to a successful Wildcat Week.

As our observing year continues, we have a solar picnic coming up soon, followed by public observing at our McHenry County and DeKalb County sites as well as at local libraries. Please bring out a telescope and share your knowledge and views of the night sky with interested attendees at these events.

Several of the club officers are now in their third year at their current position. Our bylaws set a three year term limit on elected officers so we will need other club members to fill these positions. We are looking for someone interested in the club Secretary position and someone interested in the Vice President of Social Activity, Publicity and Membership position. Being a club officer is a way to get to know your fellow club members and to give back to the club. Please consider one of these positions, or any other officer position for the coming year. Remember, our elections will be held at the November meeting, a month earlier this year than usual.

CLUB GENERAL INFORMATION

Annual dues are $25 for individuals or families and $15 for students (under 18) payable each calendar year.

Visit the club's website at **www.nsaclub.org**.

Receive your newsletter by e-mail and help save costs. Contact Edith Auchter to sign up at auchfam@comcast.net

Get a discount on your *Sky and Telescope* and/or *Astronomy Magazine* by subscribing or renewing through the club. Sky and Telescope - $32.95/year: To renew, send your renewal notice (or at least the customer number from your mailing label) and a check made out to SKY PUBLISHING for $32.95. Astronomy - $34.00/1 year or $60.00 for 2 years. To renew, also send your renewal notice or customer number. Kalmbach requires us to send a club check for subscriptions, so make your check to Northwest Suburban Astronomers. Contact Alan Birkner at alanbettina@sbcglobal.net or 847-375-0348.

Club members may **rent the club's travel telescope** for $10 per month. Contact Quinn De Smet for details at quinnnsa@mreg.fief.org or 847-490-8845.

The NSA is a member society of the Astronomical League. Visit http://www.astroleague.org/ for information on the observing award programs.

WELCOME TO NEW MEMBERS

Mario, Mia, Lorenzo, and Angelo D'Alessio
10525 N Church St
Huntley, IL, 60142
847-814-6696

Treasurer's Report

Alan Birkner

August 23, 2015

Beginning Balance	$7,337.58
Income	
Membership Dues	121.91
Ending Balance	$7,459.49

OBSERVING DATES

August 30	SOLAR Observing @ Stillman
September 4-5	Coral Woods
September 11-13	Afton
September 12	PUBLIC @ Afton
September 18	Marengo Ridge
September 19	PUBLIC @ Marengo Ridge
September 27	Lunar Eclipse Night Hike at Crabtree
October 1 and 9	PUBLIC @ libraries

Public Solar Observing and Potluck
Stillman Nature Center
33 West Penny Road, South Barrington
Sunday, August 30, 2015 from noon to 3:00 p.m.

Join the **Northwest Suburban Astronomers** and observe our nearest star with special telescopes and filters. See sunspots and solar prominences in remarkable detail! This will be a fun and safe activity for the entire family.

After observing the sun, take a hike on your own or join a walk led by Stillman's naturalist.

If you like, bring a dish and join us for a potluck picnic. *Remember to call Stillman at (847) 428-OWLS* and let us know if you're coming. If the weather is iffy, call Stillman for an update before making the trip.

Observing Notes – September 2015

We begin our discussion of the September observing opportunities with a sight for the end of September. On the night of September 27, the Moon will pass through Earth's shadow for a total lunar eclipse. The penumbral eclipse begins at 7:12 pm with the partial eclipse phase beginning at 8:07 pm as the Moon enters the umbra of Earth's shadow. Totality begins at a convenient 9:11 pm. The moment of greatest eclipse is at 9:47 pm. The Moon begins to leave the Earth's shadow at 10:23 pm. The partial eclipse phase ends at 11:27 pm. The Moon leaves the last traces of the penumbra at 12:22 am on the morning of September 28.

For those keeping track, the eclipse will last for 5 hours and 10 minutes. And this will be a so-called Super Moon, sure to get some media mention, and a Harvest Moon, to boot. During the eclipse, the Moon will be in the constellation Pisces.

All month long, Saturn provides evening observers with a telescope target. Plan on pointing your telescope toward Saturn earlier in the evening while it is still high above the horizon. Saturn is in the constellation Libra, has a brightness of -0.6 magnitude, shows a disk size of 16 arc seconds, with the rings spanning 37 arc seconds and tilted at 24 degrees to us.

Mercury is low in the early evening sky during the first half of September.

Pluto is less than 0.7 degrees from the 3.5 magnitude star Xi^2 Sagittari during September and provides a challenging 14.2 magnitude speck for observers.

Neptune is at opposition on August 31 in Aquarius at magnitude 7.8.

Uranus is headed toward opposition in October and is in Pisces.

Early risers may see Venus, Mars and Jupiter. Look for the three planets in a line with Regulus on September 21.

The Epsilon Perseid meteor shower peaks on September 9. Expect about 5 meteors per hour.

Other meteor showers during the month include Aurigid meteors on September 1, Lyncid meteors on September 6, Taurid meteors on September 14, Kappa Aquarid meteors on September 21, and Alpha Aquarid on September 23.

Asteroid Metis is at opposite on September 5 in Aquarius.

Asteroid Vesta is at opposition on September 28 in Cetus.

Also look for Asteroids Eunomia in Pegasus, Papagena in Cetus, Ceres in Sagittarius, Lutetia in Capricornus, and Amphritrite in Aires.

Comet 67/P Cheryumov-Gerasimenko moves from Gemini into Cancer in the dawn skies of September. This is the comet being accompanied by the Rosetta spacecraft and carrying the ill-fated Philea lander.

Other comets to watch include C/2014 Q2 Lovejoy in Bootes, C/2014 F4 Jaques in Lyra, 141P/ Machholz in Gemini, and C/2012 F3 Panstars in Sagittarius.

Upcoming comets include C/2013 US10 Catalina which is predicted to reach magnitude 4.5 in November, and 22P/Kopf which may reach magnitude 9.5 in October.

Last quarter Moon is on September 5, new Moon is on September 13, first quarter Moon is on September 21, and full Moon is on September 27.

Autumnal equinox is on September 23.

For the astrophotographers, September 30 is the 135th anniversary of the first photograph ever taken of the Orion nebula. Henry Draper took the photo on this date in 1880.

Minutes of the July 31, 2015 Meeting

Jim Ammeson, Secretary

Mark Christensen (VP of Programs) brought the meeting to order at 7:37 with 40 people present. The presentation for the evening will be member's latest astro-projects. The first to take the floor was Detlef Schmidt.

Detlef's project was to build an entire telescope. The telescope was of a variable focus length design (f/8 and f/4) and utilized a wynne corrector.

Next, Jim Wolford discussed how to build a cage for a truss tube dobsonian telescope. His example was for a 32" telescope he is currently working on.

Charlie Klingel discussed a maksutov he found on eBay for cheap. It was factory sealed and out of collimation, so he needed to disassemble it and find a way to correct the problem. In the end, he built his own artificial star using an LED, a couple lenses, and some other parts.

Bob Pease discussed his experiences repairing a CG5 mount to clean and repair it. He learned that the CG5 is one of the most difficult mounts to work on, though he learned a lot in the process.

Alan Birkner explained how he built a finder scope for use during solar observing using a small diameter finder scope and white card stock to project an image on.

After Alan, Mark Christensen took the floor again to discuss his own topic: building a controller for a G11 mount. He build the circuitry and even programmed the control software in Assembler.

Bill Spizirri had an impromptu final presentation to add: making a solar filter out of specialized mylar material, which was a very simple process.

8:52pm: All of the presentations being over, Mel Robinson (President) opened the business meeting. He welcomed everyone to the 2nd July Meeting. He reminded everyone that Wildcat is next week; there was discussion of the public as well as the pot luck that would be held at Wildcat. After the Wildcat discussion, Mel asked if there were any visitors at the meeting and there was one.

This month's Observer's Challenge is The Swan Nebula, M17. Mel showed everyone an option for a new name tag for the club: a star chart of Orion from the program Stellarium. There was a fair bit of discussion regarding the name tags, though there was no clear consensus. Mel also reminded everyone that there will be no December meeting due to the conflict with Christmas; this pushes the elections forward to November, so a nominating committee needs to be put together soon. A motion was made to pass the previous month's minutes, which passed.

Mark Christensen announced that Michelle Nichols will be presenting at next month's meeting on the Apollo Program.

Before ending the meeting, Mel reported the upcoming observing dates. The meeting ended at 9:11.

Wildcat Mountain

Tom & Edith Auchter

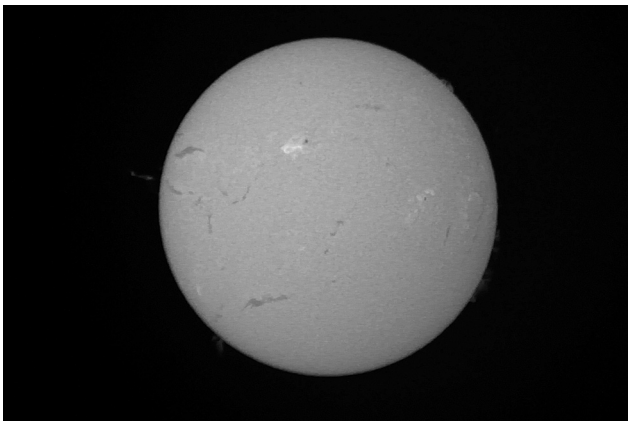
Thanks to Mel Robinson for an outstanding public presentation at Wildcat this year. There were about 125 visitors with most attending the talk and all enjoying views through member telescopes. We also had quite a few campers join us on other nights, including a young man from Hawaii who found us on Facebook! Sharing views with young children is quite rewarding. Several Wildcat staff also joined us for observing on multiple nights. It is important that park visitors are allowed on the site with us the first several hours of any night.

There were 42 members who attended the event this year. There were fabulous horizons, especially to the south and west. We did have a campfire on Thursday when it was murky and observed on all other nights except the first Sunday when it was overcast. Excellent imaging nights and good solar observing, too. We worked with park staff to reserve July 29 - August 8, 2016. Put in on your calendar now! It's a terrific event that you don't want to miss!

Observing Field and Weather Station at Wildcat by Tom Auchter

Aurora Borealis at Wildcat by Edith Auchter

Imaging Conference at Wildcat by Tom Auchter



Solar Prominence Drifting Away at Wildcat
by Tom Auchter

Observing Field at Wildcat by Tom Auchter

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration. NASA created the Space Place program to give the public the opportunity to explore the space program's technological advancements and delve into its discoveries.

The Space Place program has a Web site aimed at children but equally as fun and educational for adults. We invite you to explore the web site at http://spaceplace.nasa.gov

Solar Wind Creates—and Whips—a Magnetic Tail Around Earth

by Ethan Siegel

As Earth spins on its axis, our planet's interior spins as well. Deep inside our world, Earth's metal-rich core produces a magnetic field that spans the entire globe, with the magnetic poles offset only slightly from our rotational axis. If you fly up to great distances, well above Earth's surface, you'll find that this magnetic web, called the magnetosphere, is no longer spherical. It not only bends away from the direction of the sun at high altitudes, but it exhibits some very strange features, all thanks to the effects of our parent star.

The sun isn't just the primary source of light and heat for our world; it also emits an intense stream of charged particles, the solar wind, and has its own intense magnetic field that extends much farther into space than our own planet's does. The solar wind travels fast, making the 150 million km (93 million mile) journey to our world in around three days, and is greatly affected by Earth. Under normal circumstances, our world's magnetic field acts like a shield for these particles, bending them out of the way of our planet and protecting plant and animal life from this harmful radiation.

But for every action, there's an equal and opposite reaction: as our magnetosphere bends the solar wind's ions, these particles also distort our magnetosphere, creating a long magnetotail that not only flattens and narrows, but whips back-and-forth in the onrushing solar wind. The particles are so diffuse that collisions between them practically never occur, but the electromagnetic interactions create waves in Earth's magnetosphere, which grow in magnitude and then transfer energy to other particles. The charged particles travel within the magnetic field toward both poles, and when they hit the ionosphere region of Earth's upper atmosphere, they collide with ions of oxygen and nitrogen causing aurora. Missions such as the European Space Agency and NASA Cluster mission have just led to the first accurate model and understanding of equatorial magnetosonic waves, one such example of the interactions that cause Earth's magnetotail to whip around in the wind like so.

The shape of Earth's magnetic field not only affects aurorae, but can also impact satellite electronics. Understanding its shape and how the magnetosphere interacts with the solar wind can also lead to more accurate predictions of energetic electrons in near-Earth space that can disrupt our technological infrastructure. As our knowledge increases, we may someday be able to reach one of the holy grails of connecting heliophysics to Earth: forecasting and accurately predicting space weather and its effects. Thanks to the Cluster Inner Magnetosphere Campaign, Van Allen Probes, Mars Odyssey Thermal Emission Imaging System, Magnetospheric Multiscale, and Heliophysics System Observatory missions, we're closer to this than ever before.

Kids can learn about how solar wind defines the edges of our solar system at NASA Space Place. http://spaceplace.nasa.gov/interstellar

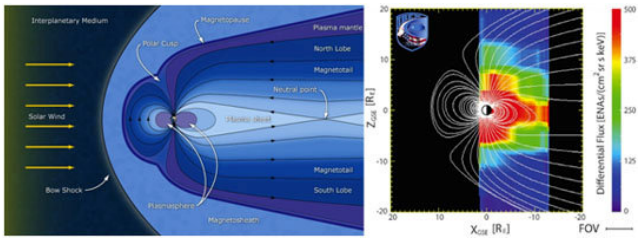


Image credit: ESA / C. T. Russell (L), of Earth's magnetic tail and its cause: the solar wind; Southwest Research Institute / IBEX Science Team (R), of the first image of the plasma sheet and plasmasphere created around Earth by the solar wind.