September/October 2017

★BUFFALO ASTRONOMICAL ASSOCIATION★

THE SPECTRUM

Different Cosmologies From The Standard Model

Look Up, Little one. Look up.

How to: Photographing the Moon with a DSLR

The Official Newsletter of the Buffalo Astronomical Association

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ABOUT THE COVER

Here is an image of a portion (Mexico) of the North America Nebula, or NGC 7000. It is part of a massive nebula complex comprising NGC 7000, IC 5070 (the Pelican Nebula) and IC 5068. It is an HII emission cloud of interstellar gas, located near the tail star (Deneb) of the constellation Cygnus.
This image comprises hues used in narrowband processing, known as HST, or Hubble Space Telescope palette. Processed by Derek Bill

THE PRESIDENTS FIELD OF VIEW

Hello Fellow BAA'ers.

What an exciting time for us to return after our summer recess for our 2017-2018 club activity and observing season! It's very likely we're all still coming off our "eclipse high", whether you experienced the stunning visual impact of partiality or had the opportunity and good fortune to experience the awesome splendor of totality. I was fortunate to experience 1 awe-inspiring minute and 51 glorious seconds of totality with my wife Beth, close friend Susan and little pal Huckleberry, as well as with fellow BAA member Dennis Bartkowiak, his wife Patty and daughter Audrey. Thank you to Dennis for "scoping" out this great eclipse observing venue! The experience was further enhanced by sharing telescopic views of partiality with 100's of wonderful people of all ages from the town of Traveler's Rest, SC as well as those from various points around the southeast who staked their claim in the eclipse observing field.

Additionally, Dennis and I enjoyed our "day of fame" as we were "The boys from Buffalo" and a must see. What an extraordinary day! Sadly, I lack the prose and poetry to fully capture in words the grandeur of what may have been the most beautiful natural phenomenon I've ever witness. A true celestial spectacle! It's also been a very exciting time for the BAA and will continue to be so. Since our last meeting back in June we had many club activities which included, in part, our well attended "Member's Star Party at the BMO", an enormously successful second "Astronomy On the Outer Harbor @ Wilkeson Pointe" which drew well over 500 visitors, three of Steve Smith's "Wilson Star Search" public observing nights, three "Public Nights at the Beaver Meadow Observatory (BMO)", as well as the participation of many members contributing to the partial eclipse experience locally at the various venues throughout WNY. Additionally, there has been many well needed upgrades to the observatory and some of our astronomy gear thanks to the dedicated hard work of many of our members and the generous donations of members and the public.

Most exciting is our 2017-18 fund-raising campaign to construct an additional smaller domed observatory next to our current main observatory. In doing so, we will boost club member observing and astrophotography capabilities as well as enable us to enhance our astronomy education outreach and monthly public observing night experiences for our visitors. With all the recent increased interest in astronomy it is a perfectly stellar time for us to undertake this project.

I would like to welcome all new members that have joined us during our summer hiatus and welcome back all current members. Take advantage of the wealth of knowledge that is freely shared by our "BAA family"!

We welcome your input, contributions, friendship and passion for astronomy.

"Totality, mere moments. The memory, a lifetime."

Respectfully,
Mike Anzalone
President

Totality taken through Televue 76mm by Mike Anzalone

DID YOU KNOW?

-The Sun is 400 times larger than the Moon but is 400 times further away from Earth making them appear the same size.

-Because of the speed the Sun moves at, solar eclipses can last at most 7 minutes and 58 seconds.

-Lunar eclipses, however, can last 1 hour and 40 minutes.

-The light emitting from the Sun is actually 30.000 years old

-The average galaxy contains "only" 40 billion stars.

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www.buffaloastronomy.com

Help Support The BAA by choosing the BAA as your charitable donation within Amazon. Every little bit helps!

amazonsmile
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CALENDAR

September 2	Dusk till 12 Midnight	Public Night @ BMO
September 5	12:00 A.M.	Neptune at Opposition
September 6	2:03 P.M.	Full Moon
September 8	7:30 P.M.	General Meeting
September 9	8:00P.M.	Wilson Star Search
September 12	5:00 A.M.	Mercury @ Greatest Elongation West
September 22-24	N/A	Black Forest Star Party
October 7	Dusk	Public Night @BMO
October 13	7:30 P.M.	General Meeting
October 14	8:00 P.M.	Wilson Star Search
November 10	7:30 P.M.	General Meeting
December 8	7:30 P.M.	Holiday Party

SEND CALENDAR EVENTS TO
Mike Humphrey thespectrum@buffaloastronomy.com
FOR THE LATEST INFORMATION ON CLUB EVENTS,
visit http://www.buffaloastronomy.com/events

MEMBERSHIP APPLICATION

You can join (or renew) at the organization web site, http://www.buffaloastronomy.com.
Click the 'Join BAA' Tab. To Join by mail Send funds to address shown along with the following information: Name, Address, Phone Number, Special Interests in Astronomy, Do you own a Telescope? (If so, what kind?), and where you first heard of The BAA.

BAA MEETINGS

All meetings are held at the Buffalo State College classroom building. For directions to the location and more information see the last page.

GENERAL MEETING
7:30 P.M. room C122
Classroom Building

STELLAR NURSERY MEETING (Kids under 10)
7:00 P.M. room C122
Classroom Building

"TUESDAY" NIGHT IMAGERS MEETING
AS POSTED by Dan Marcus via E-mail @ BMO

GENERAL MEMBERSHIP MEETING

The Buffalo Astronomical Association holds its regular monthly General Membership Meeting on the second Friday of each month.

BOARD OF DIRECTORS MEETING

The Board of Directors Meeting is held on dates and at locations scheduled by the board. Information provided to The Spectrum will be published. The meetings are open to all members of the Society in good standing. Attendance is encouraged.

BAA Directory

CLUB OFFICERS

PRESIDENT
Mike Anzalone
VICE PRESIDENT
Mike Humphrey
SECRETARY
Neal Ginsberg
TREASURER
DaRand Land

AT-LARGE-DIRECTORS
Noah Erhart
Taylor Cramer
Steve Smith

COLLEGE OF FELLOWS
Rowland Rupp

BMOS RESEARCH ASSOCIATE
Alan Friedman

OBSERVATORY DIRECTORS
Dan Marcus
Gene Timothy

SPECTRUM EDITOR
Mike Humprey

WEBMASTER
Gene Timothy

AD-HOC OUTREACH COMMITTEE
Jim Lehman
Tom Heyer

MEMBERSHIP CHAIR
Dennis Bartkowiak

SEPTEMBER GENERAL MEETING

JOIN US FOR THE SEPTEMBER GENERAL MEETING

our September general meeting will be filled with stories, images and videos of those BAA members who traveled to view the Great American Solar Eclipse from the totality centerline. Presenters will include, but is not limited to Phillip Newman, Mike Plotar, Dennis Bartkowiak, Gene Timothy, Ernie Jacobs, Alan Friedman and Mike Anzalone.

BAA member publishes book

Richard Wilds has recently published the book, Bright and Dark Nebulae: A Guide to the Clouds of the Milky Way Galaxy, CreateSpace, 2017. It is available from CreateSpace now (https://www.createspace.com/7355429 paperback or ebook) and will be available from Amazon and bookstores soon. This will be the first detailed discussion on the topic of dark nebulae in 90 years since it was tried posthumously by E.E. Barnard in his 1927 publication. When Barnard wrote on the topic, he was only discussing the northern sky. Richard's work covers the entire sky and brings in many professional works on the topic from the past century. The foreword was written by Aage Sandqvist, the world's leading authority on Dark Nebulaekind.

BAA Welcomes Dennis Bartkowiak as New Membership Chair

Dennis Bartkowiak has taken over the Membership Chair position from Alan Friedman who has decided to retire after overseeing the Club Membership for the better part of 20+ years. The BAA would like to thanks Alan for his tenure and welcomes Dennis aboard.

Welcome to Our New Members

Tim Joyce
Douglas Visger
Susan McCartney
Emily Oaks
Gregory Ruhland
Pat Crants
John & Phyllis Bieger

Welcome to New Board Members

At our June Annual Business Meeting and Pizza Party We were pleased to announce the results of our election of three At-Large Directors. Congratulations to new board members Noah Erhart, Taylor Cramer, and Steve Smith. We look forward to more great things happening with the BAA under your 2017-2019 tenure. Welcome aboard and lets shoot for the stars.

CHECK THE WEBSITE

BUFFALOASTRONOMY.COM

The BAA website not only has news and information about our association, but also a variety of features to manage your membership and connect with other club members. Current members can post photos, trade gear, pay dues, manage discount magazine subscriptions, swap stories in the forum, and more. Questions about the site? Need a hand to get your account set up? Contact webmaster@buffaloastronomy.com

TREASURER'S REPORT

By DaRand Land

The Treasury is in good standing and includes the following figures.

Account Balances as of (09/04/2017)
Paypal account : $799.82
KeyBank-Money Market $22015.56
KeyBank-Checking $3250.49

Notable Astro Events For September

Forty-five deep-sky objects for September: M2, M72, M73, NGC 7009 (Aquarius); M30, NGC 6903, NGC 6907 (Capricornus); B150, B169, B170, IC 1396, NGC 6939, NGC 4343, B361, Ba6, Be87, Cr 421, Do9, IC 1369, IC 4996, IC 1516, LDN 906, M29, M39, NGC 6866, NGC 6871, NGC 6888, NGC 6894, NGC 6910, NGC 6960, NGC 6992, NGC 7000, NGC 7008, NGC 7026, NGC 7027, NGC 7039, NGC 7063, NGC 7086 (Cygnus); NGC 6891, NGC 6905, NGC 6934, NGC 7006 (Delphinus); NGC 7015 (Equuleus); M15 (Pegasus); NGC 6940 (Vulpecula)

Top ten binocular deep-sky objects for September: IC 1396, LDN 906, M2, M15, M29, M30, M39, NGC 6939, NGC 6871, NGC 7000

Top ten deep-sky objects for September: IC 1396, M2, M15, M30, NGC 6888, NGC 6946, NGC 6960, NGC 6992, NGC 7000, NGC 7009

Comet C/2015 ER61 (PanSTARRS) passes southwestward through Taurus during September. The tenth-magnitude comet lies within three degrees of the bright open cluster M45 (the Pleiades) this month. For further information on comets visible in September, browse http://cometchasing.skyhound. com/ http://cometchasing.skyhound. com/ and http://www.aerith.net/comet/ future-n.html http://www.aerith.net/comet/ future-n.html

During September, Venus shrinks in apparent size from 12.4 to 11.2 arc seconds but increases in illumination from 84% to 91%. Venus is occulted by the Moon from some parts of the world on September 18th and passes very close to Regulus on the night of September 19th.

Mars enters the morning sky in Leo in mid-September. The Red Planet has a very close conjunction with Mercury on September 16th and is occulted by the Moon in some parts of the world on September 18th.

Events and Astro Happenings provided courtesy of Dave Mitsky's Astru Calendar

2017/2018 Beaver Meadow Observatory Improvement and Upgrade.

Our building at Beaver Meadow has provided us with outstanding service and outreach capabilities. As an increased number of members use the facility on a regular basis and we have furthered our outreach programs, the current facility has had limitations in keeping up with these expanded projects and increased public traffic. We have had additional donations of telescopes available for member use which require additional space and we are beyond capacity for the seminars and groups we have hosted at the observatory. To improve our ability to expand member knowledge, skills and resources along with the ability to handle even larger public outreach, we have taken on the project of improving and upgrading our facilities.

The first phase has already begun as we have taken down the smaller scope building and refurbished the pier. This has already allowed use of a third stable observing platform with an improved southern view. Additionally, the focuser for the areas largest telescope available to the public, our 20" Obsession, has been upgraded. Next is the construction of a 10' by 10' domed observatory for both visual observing and astrophotography with a planned construction once approved by the Beaver Meadow Audobon Society board, along with an expansion of the existing observatory. These improvements provide significant benefits for Public Outreach, Beaver Meadow and our members. They allow us to continue our very positive results and the cost is limited.

Our goal is to raise at least $15,000 to support this project. We currently have a match for the first $5000 raised and our fundraising committee is already reaching out to corporations and foundations for their support. We have made many friends over the years and we have a long track record of public service in Western NY and Buffalo which should help us achieve our goal. Member participation is also key to supporting this effort.

Asking for money and donating can be difficult. However, if you consider your BAA membership, which includes access to state of the art equipment, loaner telescopes, the ability to further your education, the wealth of technical knowledge and skill available to you, the opportunities to share your experience in private and public settings along with the opportunity to impact the life of someone whose first look through a telescope is at a BAA public event, you can make a difference and that has substantial value.

I am excited to chair this committee and will ask you for your help and donations over the next few months as we undertake this effort to raise the needed funds. I know that if we all take part, our goal can be achieved. I appreciate your support and the opportunity to serve you and our community. If you would like to donate, please contact me.

Dennis Bartkowiak
BAA fundraising chair
716-207-2316

Astronomical Quilt raffle to raise funds for the new Observatory

Starting at the September General Meeting Tickets will be sold to win this handmade Astronomical Quilt generously donated by Mike & Linda Plotar.
Tickets will be $10 each or 3 for $20. raffle will be held at Novembver General Meeting.
Contact Dennis for more information and check our website as well.

OBSERVATORY REPORT

By Dan Marcus and Gene Timothy

We have been very busy at the Beaver Meadow Observatory with maintenance and upgrades to both the outside and inside. early this year we replaced the aging sophet boards. We replaced and painted the peak boards as well. New cabinets have been built to house supplies and better organize.

"ROBOSCOPE" OBS REMOVED AND PIER RE-STORED

The old "roboscope" observatory was dismantled and hauled off to make room for more observers and/or imagers. The 'roboscope building has not been used for many years. The ground where the 'roboscope" building once stood was cleaned up and leveled to match the surrounding area. The pier was resurfaced and given a new paint job to withstand weathering. The pier has also been leveled and the electricity has been restored. Depending on plans we will be running a USB 3 cable from the warm room in the observatory to this pier this fall so that it can be used for imaging by club members for Public Nights.

or

NEW LIGHTING FIXTURE HAS BEEN INSTALLED to replace an aged and non Dark Sky approved light on the Beaver Meadow garage. .This will enhance the viewing at BMO and not affect the night vision of BAA members when observing or interfere with BAA imagers. New Red lightbulbs have been purchased to replace the aging lights that line the walkway from the visitors parking lot at BMO and will help better light the way to our observatory on Public Nights.

NEW FOCUSER INSTALLED ON OBSESSION

Dennis, Mike Plotar and Gene installed and aligned the focuser. This new focuser is a welcomed upgrade well over due. This new focuser will now hold focus better. Is smoother and will allow for the use of better and more heavy eyepieces.

BOARD APPROVED OBSERVATORY EXPANSION

At the July board meeting, a 10 foot Building with dome was approved by the board. the proposal has now been sent to the Beaver Meadow Audobon Society's Director for presenting to their board for approval.

The Keycodes on the Observatory have been changed and new observatory rules have been posted. If you would like to access the Observatory please come to one of the Tuesday Night imaging sessions for a recertification and we will give you the new keycodes. We have posted the new observatory rules on page 8.

NEW OBSERVER AND ASTROPHOTOGRAPHY PROGRAM WITH CERTIFICATES

Are you interested in developing skills in observational astronomy? Want to see all kinds of objects throughout the year? Try our observing program. It's designed to feature objects visible from our Observatory and Dark Site in North Java. Observers who successfully complete the observing program will be presented both a pin and a certificate of completion at the BAA General Membership Meeting. The program is coordinated by Observatory Co-Director Gene Timothy.

TELESCOPE LOANER PROGRAM (AVAILABLE TO MEMBERS ONLY)

One benefit of membership in the Buffalo Astronomical Association is access to the variety of telescopes that are part of the BAA Loaner Scope Program. This program allows members who don't own or have access to a telescope to borrow one for touring the night sky. The program is coordinated by the Observatory Co-Directors. For more information contact them via the BAA website

As usual we have way too much fun at the observatory, We hope you'll join us at the observatory!

OBSERVATORY RULES

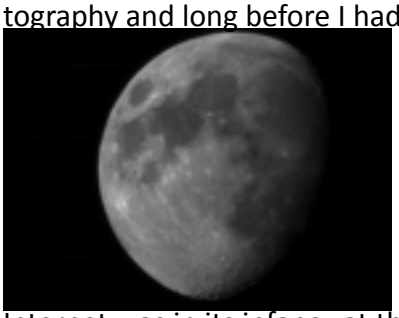
1. All users of the Observatory are required to record their arrival Date along with any comments in the Observatory logbook.
2. On arrival check the logbook and notice boards for any reports of damage to or failure of equipment.
3. Members visiting the Observatory must ensure that the Observatory is left clean and tidy at all times. All trash must be removed upon departure. (If you brought it in – take it out.) Any cans or bottles with deposits must also be removed.
4. Smoking in the Observatory or on the grounds is not permitted.
5. No lights other than red lights are permitted to be used on the field surrounding the observatory when the moon is below the horizon or imagers are present.
6. Do not operate any observatory equipment until you have been trained and certified by the Observatory Directors and your name has been posted on the list of authorized users. (This includes the roll-off roof, roof rails, C14 and 20inch telescopes and all other equipment.)
7. Due care and diligence must be taken by all members when conducting themselves and guest parties around the Observatory site. Remember the BAA are guests at Beaver Meadow.
8. Members may bring family and friends to the Observatory as guests provided that:
   a. No personal profit or income is derived from the activity.
   b. They have checked for planned public events or maintenance work being carried out.
   c. Member is responsible for guest
9. Upon Departure ensure the locks are zeroed out before locking the various doors and/or cabinets. Ensure all doors are closed and locked before leaving.
10. Please do not drive cars on grass! The pathway to the observatory is for pedestrian use. Do not backup to the piers or observatory to unload equipment.

HOW TO: PHOTOGRAPHING THE MOON USING A DSLR

Shooting for the Moon...its easier than you think!

By Gene Timothy

I confess, I am reluctant to admit it. You may not want to either, but, my first photos of the moon were pretty bad. They were taken before the age of digital photography and long before I had a clue on what to do when photographing the moon. Many, many rolls of film were wasted each week when the Moon was full. I would snap off roll after roll of film based on books I had read (the Internet was in its infancy at the time) trying every F stop and every Aperture combination known to a 19 year old college kid. I would rush to the 1 hour photo processing lab and gladly hand over my $10 and rush back home to have a look at my masterpieces....except they were far from anything I would put in a scrapbook or even show to my family. Nowadays it is easier than ever to take great photos of our the Moon.



Here are 5 easy steps to use when photographing the moon.

1. **Use manual exposure**. Camera's automatic settings usually get fooled and overexpose it. Adjust Your exposure manually to get the moon bright, but not white. Learn how to understand your camera's histogram.
2. **Use manual focus**. Many digital cameras struggle to focus in dim lighting situations. Don't just set your focus at infinity; you may not get the focus spot on.
3. **Use the longest lens** or most powerful zoom setting you have. Even when the moon looks big and bright to the naked eye, it's really a small and distant object. Remember Most of the Prosumer DSLR are not Full Frame and actually work toward your benefit. APS-C sensors magnify the lens focal length by 1.6X or 1.5X depending on if its a Canon or Nikon.
4. **Use a steady tripod.** Even the slightest movement will ruin your sharpness and sharpness is critical to see all of those amazing lunar details.
5. **Use a cable release** or t**he camera's self-timer** to eliminate ALL camera shake. Did I mention sharpness is critical?

Settings for Photographing the Moon

ISO -cameras should be set to 100 or lower to eliminate noise and graininess.

Aperture- Because you're after crisp, clean shots shooting at f/11 to f/16, depending on your lens, will be the best place to start.

Shutter speed - This will be the point at which you will need to adjust on a number of shots. The variables are many and include the phase the moon is in, geographical location and desired shot, but on a clear night starting at about 1/60th should be a great middle ground for a wide angle shot, while a telephoto should start at 1/125 or higher depending on your lens.

Try starting with camera settings like ISO=100 1/125 second at f/11.

That will get you started in the right neighborhood. For the advanced photographers who desire an accurate color balance and want to adjust color temperature, start with 4000K and adjust to how "golden" you want your moon to appear.

Once you have your settings for the Moon, you can begin to take things a bit further and think about your composition. As compelling as a beautifully sharp, detailed image of a lonesome moon is, once you've seen one, you've seen them all. Getting that perfect close-up is excellent practice, but try to get creative by placing the moon within a more complex composition.

For instance, you could try framing it behind trees and buildings, or reflecting it off the surface of a still lake. Placing other objects in the foreground gives the moon context and scale that it lacks on its own. Think of the moon as a single element which should be incorporated along with other compositional elements and techniques to make a great final photograph. Clouds are not your enemy when photographing the Moon, it can add an extra layer(pun intended) to your composition and can even enhance your photos and give it that eery kinda look. The sky

is literally the limit when composing your images, there are endless possibilities and you can really get creative when adding other elements to you photographs of the moon.

Now if you want to cheat you can certainly drive yourself bonkers and try snapping an image

through your telescope eyepiece using your favorite brand of Smart Phone. Its amazing what results you can get with some patience and trial and error. This brings us into another totally different kind of photography and is beyond the scope of this article, but can certainly be visited at a later time. It is definitely a lot of fun, so get out and shoot some moon pics! :)

ECLIPSE BIRDS

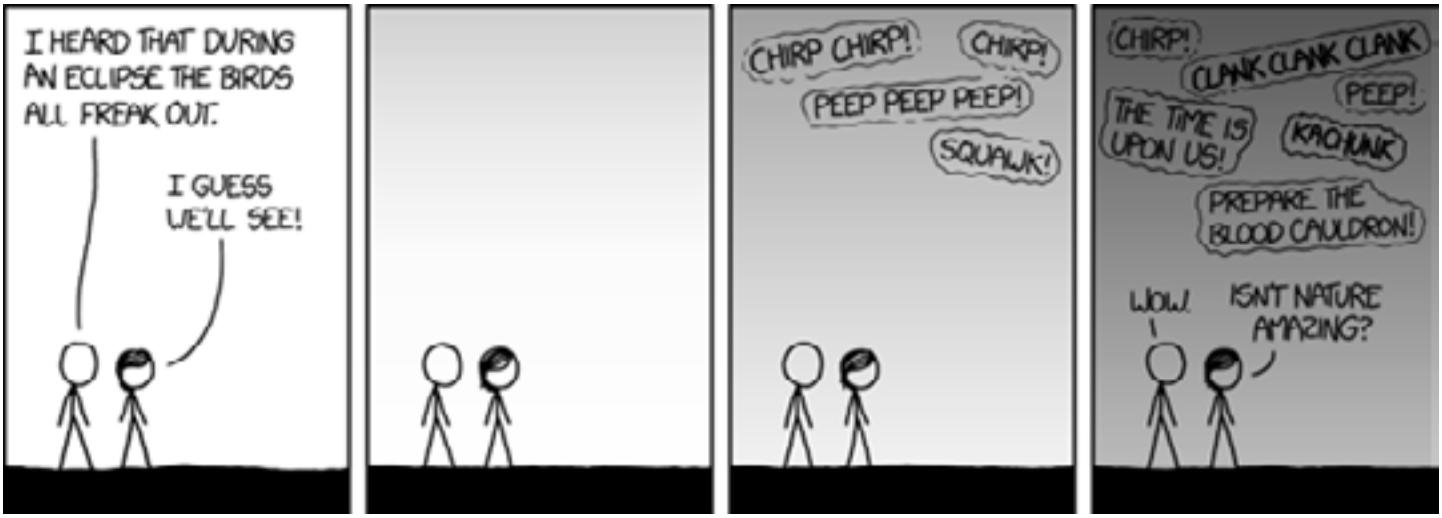


Image Credit: https://xkcd.com/1879/

Look Up, Little one. Look up.

by Paul Robinson

I understand that when the Apollo astronauts would try to respond to the countless questions people would ask them about what it was like "up there," they would often simply reply, "You had to be there." Not helpful, but definitely honest. For those who were fortunate enough to experience this past Monday's total solar eclipse, the same utterance probably would be the most honest, but also a cop out, and it deserves a bit more detail. Let's say for starters that this matchless phenomenon of nature, beyond a shadow of a doubt totally eclipsed any other experience under the sun one could possibly have.

For me, the preparation for this incomparable event began on the roof of an apartment building in Hackensack, New Jersey, when, as a ten year old I learned about the marvels of the sky from my grandpa. I was reminded of this fact on the morning of the eclipse, when, as we began to gather outside the hotel for "first contact", four of us told stories of how our passion for the sky began at 6, 7 and 10, when an uncle or grandparent pointed out points of light in the sky. Note to self, it's our turn to do the same for little ones.

My wife and I had barely heard of Paducah, Kentucky, when I was studying the ""path of totality" as they call it. But it was on a main road and totality was almost as long as any other spot, 2 minutes and 20 seconds or so. So Peducah it was, and the hotel room was reserved more than a year in advance. Fellow Grand Islanders, Tom and Kathy DeLoughry also ventured into the Path, choosing Nashville for their spot.

Good friends from our years in Olean, Diane and Mike Moses, joined us in Paducah, a couple days after we had scoped out the town. We met Fowler Black in the Visitors Center, who was the first to unveil the constant elephants in every conversation, in every venue leading up to the Eclipse: How many visitors would actually show up and would the clouds spare us the pain of their devastating presence at 1:22 the day of the Eclipse. It struck me suddenly, after a couple days of seeing the river, the flood dike and wall of murals of Paducah's history, the unbelievable beauty and impossible intricacies displayed in the world-renowned Quilt Museum, that my excitement that had filled me all these years and months and weeks of anticipation was being slowly eclipsed by all the anxiety of the retailers over expected throngs, and the eager tourists and eclipse lovers over the weather. And Paducah…what a place. What a welcoming city. Hardly a piece of litter in any part of town. Fire hydrants painted a bright fresh silver. Jazz bands tuning up for their evening gig in town and on the river front, where fifteen barges at a time were being pushed by enormous tug boats.

It was right there at the confluence of the Tennessee, Ohio, Mississippi and Cumberland rivers that tugboat captains were taught their skills, one of whom we had the privilege of talking to. "Been on the river all my life," he told us, as admiring wife and children looked on with obvious pride.

"Whadduya think? Will we get the thousands they talk about? Could this beat the 30,000 that come for the quilt events?" "So what's the latest forecast….I dunno…."

And finally it came. It really did. Monday, the 21st. I couldn't sleep, and besides, I wanted to get at least one picture of the sun, in case things went south at 1:22. So I crawled quietly out of bed and headed out the back door of the hotel. There was just a hint of light on the eastern horizon. I wondered if it would look like this during totality. Ah…but would there even be a…..Can't think about that now.

I googled sunrise in Paducah: 6:16. And the sun and just enough clouds behaved. I walked happily back to my room with a nice picture as the sun peeked through the trees suddenly. Would the Diamond Ring look that that, I wondered….

And the tripods and tents and cameras began to appear. The buzz was everywhere…but probably mostly in me. Google the weather. Iffy…but hopeful. I made the pinhole in the poster board I bought and tried it out on the full sun. Not bad. My buddy Mike had a real camera, a nice Canon with a tight-fitting solar filter on it. I had my little Canon and my iPhone.. and a black welders glass and solar glasses. Yikes. Some clouds. Which direction were they moving.

We watched the Weather channel for a couple hours as I checked the tripod and extra camera for the video I would take of the last 15 minutes leading up to and including the hoped-for Great American Eclipse.

The 96 degree heat was crushing, and the little tents sprouted up around the field like little mushrooms. "It's begun!" someone hollered. Necks craned skyward. It was 11:54. Somehow, magically, the moon and sun began their dance in Paducah at the scheduled moment. We thought about Grand Island folks who would see only a partial, 72% or so, like watching a Bills game only until the middle of the fourth quarter.

But then the clouds came. After all our preparation. After all the sunny days we had been having. After tens or hundreds of thousands of devoted "sole mates," had worked so hard to be at that place at that time. "Oh God, nooooo!" was the silent gasp that swept the field of dreams….. And then, inexplicably, magically, wonderfully, they moved to the side, and our blue spirits were lifted by pristine blue skies, as "10 minutes" rang out by someone.

And now the words do have to be said…."You had to be there…." The hush. The draining away of the anxiety over numbers and clouds, leaving finally the pure joy of excitement and anticipation.. And as I gazed up through my solar glasses at the now fingernail thin sun, a barely visible reddish curve in the darkening sky, I thought it must be safe to take a peek, and was stunned at the blinding brilliance of that tiny thin remnant of sun, seen with unfiltered protection.

And…a flash of diamond-like light on the left side of this distant orb, and darkness suddenly plunged upon us. The glasses came off, and we were staring at a shimmering spectacle that the brain stuggles to really see. "Hear the crickets!" someone near me said. A baby cried somewhere. "Look! A bright star…off to the right, by that cloud!" "It's Venus," I instructed, not able to help myself. It was something I was looking for. My wife, Ellie, was the first to see faint Jupiter, off to the left. It was suddenly cooler. I tried to get one picture of totality. And it was over. The diamond reappeared on the right side.

Of course it wasn't over. It took an hour or so for the sun to crank up the heat to its full 96 degrees again. But for me….it was over…. The weather held. The clouds were kinder to us than at some other venues along THE PATH. I had to let go of my grief on their behalf and absorb the relief and joy that we had been privileged to experience totally TOTALITY.

Will we be so lucky in Western New York on April 8, 2024? Time will tell, and till then we continue to have the opportunity to do what Grandpa Ingalls instructed me to do so many years ago:
Look Up, little one. Look up.

DID YOU KNOW?

-Only 5% of the universe is made up of normal matter, 25% is dark matter and 70% is dark energy

-Only 55% of all Americans knows that the Sun is a star.

-Seasons last 21 years on Uranus while each pole has 42 years of sunlight followed by 42 years of darkness.

Great turn out for Larry Carlino's Annual Star Party

If you have never had the chance or the experience of making one of Larry Carlino's star Parties, you need to set yourself a reminder and DO NOT MISS out on the next one. Larry is known for his vast collection of Telescopes including many Takahashi retractors as well as the show stopping 28 inch howitzer of a telescope constructed by Larry with the exception of the mirrors. the skies were semi cooperating on August 26th, with the exception of some wispy clouds that were most likely the result of the Fires out West. It was a pleasure to gaze into that 28inch Dobsonian and see the Ring Nebula. A BIG Thank You to Larry Carlino for putting on such a great Star Party

Larry's 28inch Dobsonian

Larry's domed observatory

One of many Takahashi's

Another of Larry's large Dobsonians

DON"T FORGET THE WILSON STAR PARTY is September 9th, at the calvin E Krueger Park Wilson, NY. Like Larry Carlino's star party, you don't want to miss out on Steve's famous hamburger and hospitality. For more information see our events page here

Different Cosmologies From The Standard Model

by Randy Boswell

It is standard textbook teaching that the universe began about 13.8 billion years ago with the big bang. Its vindication in 1964 by Arno Penzias and Robert Wilson of Bell Labs through their discovery of the cosmic microwave background radiation (CMBR) marked a sea change in cosmology. The salient feature of this model or big bang cosmology was that the universe had a beginning in time and space. That this was a radical shift was due to the fact that hitherto it was thought that the universe had always existed. In fact, this concept went back to the time of the ancient Greeks when Aristotle posited that the universe was eternal, but this was purely metaphysical. In modern times a scientific rationale was forwarded for the eternality of the universe.

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In 1948 the famed British cosmologist, Fred Hoyle, along with colleagues Hermann Bondi and Thomas Gold advanced the Steady State Theory. The cardinal feature of this model was the hypothesis that new matter was continuously being formed, which produced new stars and galaxies that drove the expansion of the universe. Another aspect of this model was that it predicted that the universe was composed of a homogeneous distribution of matter. This was based on Einstein's 1917 hypothesis that when viewed on a large scale the structure of the universe would appear to be homogenous and isotropic (however, it must be noted that Einstein did not believe in a continuous creation). Hoyle took this a step further and reasoned that since the laws of physics are always the same, the universe must be homogeneous in time, i.e., it has existed forever in this state. Hoyle dubbed this the perfect cosmological principle.

However, the discovery in the early sixties of quasars and radio galaxies debunked the Steady State Model of a homogenous universe. These objects were found to be at far distances away based on their high Doppler-shifts and faint radio signals. Instead of being locally distributed uniformly several million light-years away as predicted by this model, they were found at distances exceeding a billion light-years distant. Then, in 1964, the final blow to the Steady State Theory came with the discovery of the CMBR.

This solidified the support of nearly all cosmologists in favor of the big bang – but not all.

The objections on the part of the few to an initial big bang is due to a heretofore lack of a naturalistic explanation of its cause. Accordingly, this led to the Oscillating Model of the universe. First proposed by theoretical physicists in the 1920s, this theory avoids an initial beginning of the universe and

instead suggests that the universe experiences an endless series of expansions followed by collapses then expansions. The universe is presently undergoing an expansion phase of the cycle with each complete cycle taking approximately eighty billion years according to its theorists. This model gained currency during the sixties among Soviet cosmologists. However, most cosmologists point to problems with the Oscillating Model.

First, there is the matter of singularities. The laws of general relativity predict that the universe started from a singularity. Moreover, theorems by British cosmologists Stephen Hawking and Roger Penrose say that it is impossible to pass through a singularity to a subsequent state. Additionally, at present there are no known laws of physics that would stop the universe's contraction phase and cause it to re-bound and expand before it enters the singularity state. Thus, the majority of scientists do not support these scenarios as suggested by the Oscillating Model.

Secondly, there is the problem of cyclic contraction. According to the Oscillating Model, the density of the universe would generate sufficient gravity to slow its expansion and eventually bring it to a stop and further cause it to contract in on itself. This picture was discounted by a discovery made in the late nineties. Two independent teams of astronomers discovered that the universe was expanding at an accelerated rate. By analyzing the Doppler-shift data from Type 1a supernovae at distances of some 10 billion light-years away it was discovered that the universe's rate of expansion was accelerating. This led researchers to conclude that there is an invisible force driving the accelerated expansion of the universe. They termed it dark energy. Today, there is wide acceptance among astronomers for the existence of dark energy. Also, there is a high certainty among scientists that the universe will not contract but will continue to expand.

Thirdly, there is the hypothetical problem of entropy. In this scenario, if the laws of physics would somehow allow for the universe to expand and contract, studies have shown that entropy would be conserved. I.e., each successive expansion would get bigger and bigger. Therefore, working backwards the cycles would be smaller and smaller and ultimately culminate in the smallest cycle – the big bang and the beginning of the universe.

In conclusion, it can safely be said that at present, all cosmology roads lead to the Rome of the big bang. Today, the scientific community at large is in agreement with big bang cosmology. One might say that the universe began with an anomaly. I.e. the known laws physics were not valid under the conditions of the big bang. It is for this reason, mentioned earlier, that prompted a rejection of big bang cosmology or the Standard
Model in favor of alternative cosmologies. Yet, there are other anomalies in nature that defy convention and are accepted. A case in point is the Heisenberg uncertainty principle, perhaps one of the most well known anomalies in quantum mechanics. Developed in the 1930s, today it is taught in all textbooks on the subject.
The Big Bang Model – theoretically valid based on general relativity, capable of offering testable predictions, and substantiated by observational data.

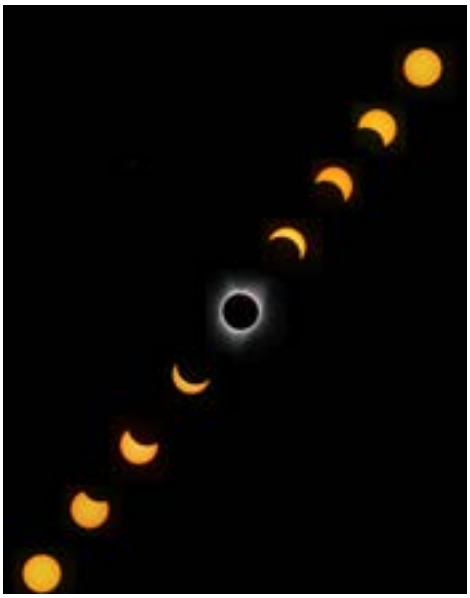
Randy Boswell has been a longtime contributing writer for The Spectrum.

DID YOU KNOW?

-8000 stars are visible with the naked eye from Earth. 4000 in each hemisphere, 2000 at daylight and 2000 at night.

-Neutron stars are so dense that a teaspoon of them would be equal to the weight of the entire Earth's population.

-The pistol star is the most luminous star known 10 million times the brightness of the Sun.



Gene Timothy

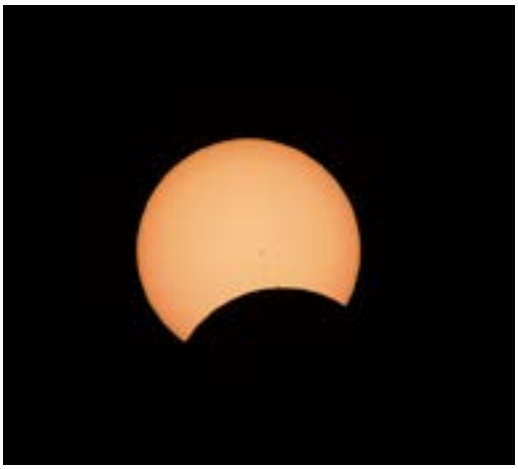
Gene Timothy

North American Nebula in Cygnus by Mike Israel

Mike Plotar

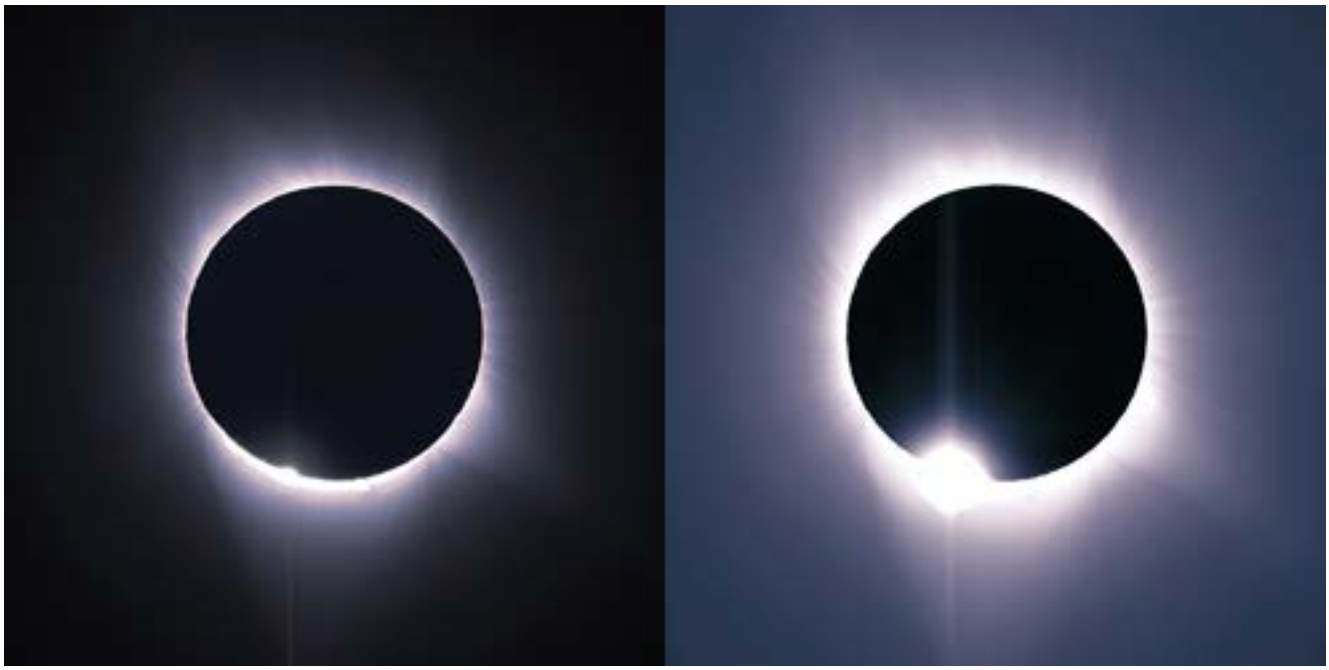
Mike Plotar

Phil Newman



Jim Maroney

Tom Heyer



Alan Friedman

Derek G Bill

Age 58
Member since: 1990

I first became interested in astronomy when I was quite young. A close friend of my fathers brought his telescope out to our home in Elma, NY. I was treated to views of Saturn and the Moon. Little did I know at the time I was looking through one of the finest instruments of its day. I was later to learn it was a Questar. For many years I had a passing interest in the heavens, that is, until I transferred to Buffalo State College. It was there that I joined the astronomy club. I became fascinated with all things astronomical. I was involved with the Observatory there, (which I believe is gathering dust in the basement of the Science building) and ran public nights for some time. I was also involved with the Ferguson Planetarium and even wrote a short program for a class. I delved into astrophotography at that point and took my first trip out to the BMO in 1986 to image Halley's comet, which was a little disappointing, for those of us that remember. I actively became involved with and joined the BAA back in 1990, but was very new to it all. The ardors of actually imaging, with successful results, were at the time strenuous and time consuming. It was then that I met Dan Marcus and Mike Israel. I learned the basics from them. Autoguiding (back in the guidedog era) was a breakthrough for me. The idea of doing a time-consuming set-up, but being rewarded with breakthrough images, was very exciting. Also, the idea of simply walking away from your gear and allowing the computer to take over was wonderful.

Since those days, things have advanced quite rapidly. I had, for some time been a co-director of the Beaver Meadow Observatory. During that time, the old was replaced with the new. The large and at times cumbersome 12" reflector, was replaced with a Celestron C-14 on a state of the Astrophysics mount. I stepped down, not too long ago, and having learned the art of narrowband imaging, I constructed my own, home observatory. I have since wired it for automatic operation from the comfort of my office. Things have come a long, long way.

My interests lie primarily with Deep Sky imaging, but I have, of late, taken an interest in Planetary imaging as well. Now, as I start the life of a semi-retired person, I hope that I can enjoy even more time enjoying astronomy and the wonders of the sky.

(Below are images Derek has taken over the years of various objects)

M42 Ultimate Small

Helix in HST Palette

IC410 Final Small

M31 Final

The Pillars of Creation

IC410 Final Small

<u>The Spectrum has a new look!</u> There are a lot of changes and even more excitement in the club and in the skies. The new build at the observatory is starting , the website is getting more views, and public interest in astronomy is growing. The obs got a new coat of paint and we thought the Spectrun could use one too.

Special thanks go to Gene Timothy for the concept and layout. I like it, but it's your turn now.

What do you think?

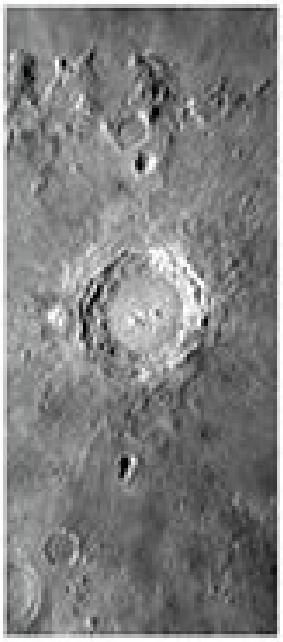
Send me an email : jetpac@iname.com.

Let me know your thoughts.

Michael Humphrey

Spectrum Editor

SKYWATCHER'S GUIDE TO THE MOON



Impact!

The Moon's cratered surface tells a violent story. Bright areas are ancient crust that make up the highlands. Dark areas are newer regions of lava that formed after asteroid impacts.

Copernicus

This crater (left) is easy to spot. It formed about 800 million years ago, and is 57 miles (92 km) wide. Note central peaks and terraced walls, caused by impact.

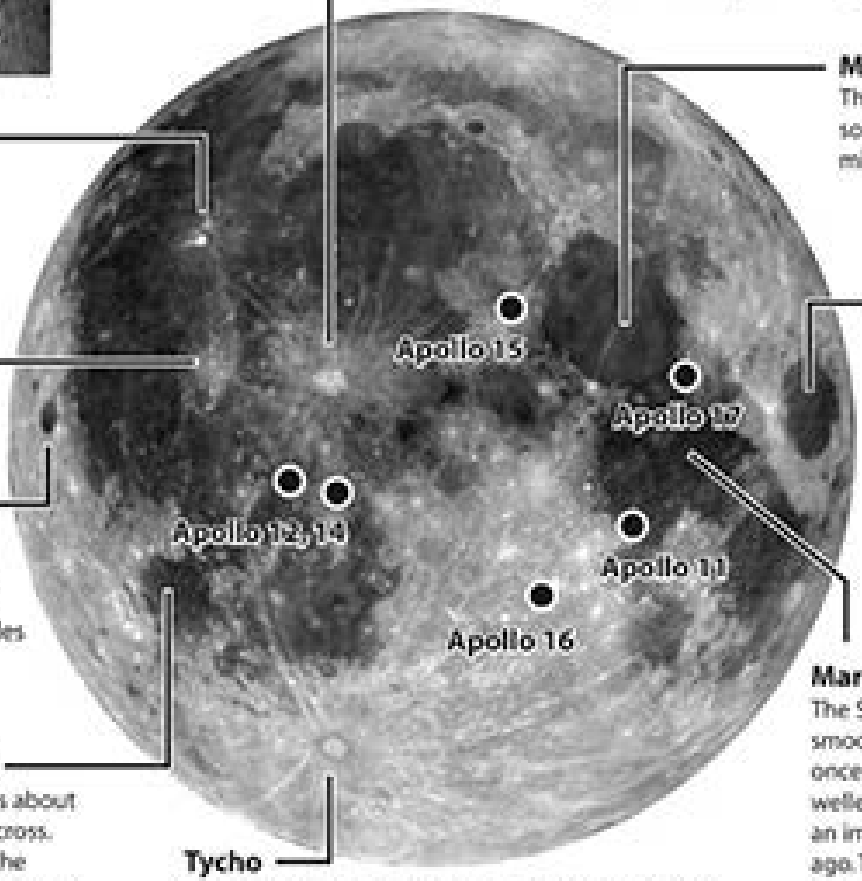
What do you see on the Moon?

Face south and look up in the sky.

Can you find the Moon?

Compare the Moon in the sky to the large Moon map below. The Moon map shows the side of the Moon that is always facing us. How much of the Moon in the sky is lit up right now? You will only see the features on the part of the Moon that is lit up.

Through a telescope, you may need to turn the map to match your view of the Moon in the eyepiece. Some telescopes will flip the image, so the Moon might look like the image to the right through a telescope.



Aristarchus
Young crater. So bright that Sir William Herschel thought it was an active volcano.

Kepler
Small version of Copernicus

Grimaldi
Lava-filled crater is one of the darkest spots you can see on the Moon. It's 145 miles wide (233 km).

Mare Humorum
The Sea of Moisture is about 220 miles (350 km) across. You can spot it with the naked eye. With a telescope, you might notice two craters along its edge.

Tycho
Young crater best seen during a full Moon. Rays of bright material are ejecta blasted out of the crust when a large asteroid struck about 109 million years ago.

Mare Serenitatis
The Sea of Serenity is solid lava, some 380 miles (610 km) across.

Mare Crisium
The Sea of Crisis is about 340 miles wide (550 km) and visible to the naked eye.

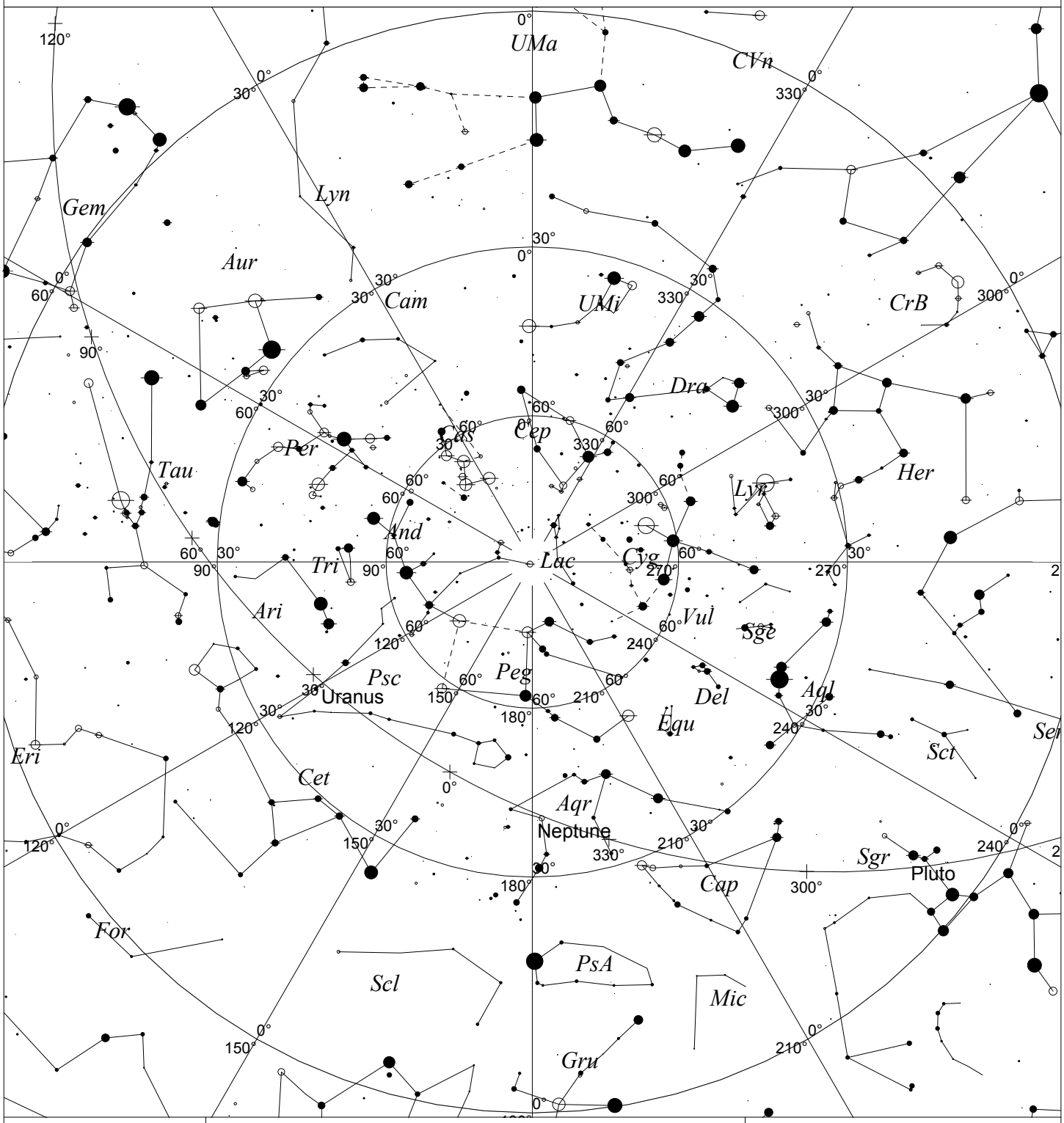
Mare Tranquillitatis
The Sea of Tranquility is a smooth plain filled with once-molten lava that welled up from below after an impact billions of years ago. The first humans to walk on the Moon, Apollo 11 astronauts, landed near the edge.

SOURCES: NASA, ADVANCED SKYWATCHING, CAMBRIDGE ATLAS OF ASTRONOMY, DK VISUAL ENCYCLOPEDIA

Photos: James Scala. Layout and text for Moon map used with permission: Robert Roy Britt/SPACE.com.

NASA Night Sky Network (nightsky.jpl.nasa.gov) administered by Astronomical Society of the Pacific (www.astrosociety.org)

Buffalo 9/20/2017 23:00:00



STARS	SYMBOLS		
<1	Multiple star	Dark nebula	Radio source
1.5	Variable star	Globular cluster	X-ray source
2	Comet	Open cluster	Other object
2.5	Galaxy	Planetary nebula	
3	Bright nebula	Quasar	
3.5			
4			
4.5			
>5			

Local Time: 23:14:40 20-Sep-2017 UTC: 04:14:40 21-Sep-2017 Sidereal Time: 23:00:07

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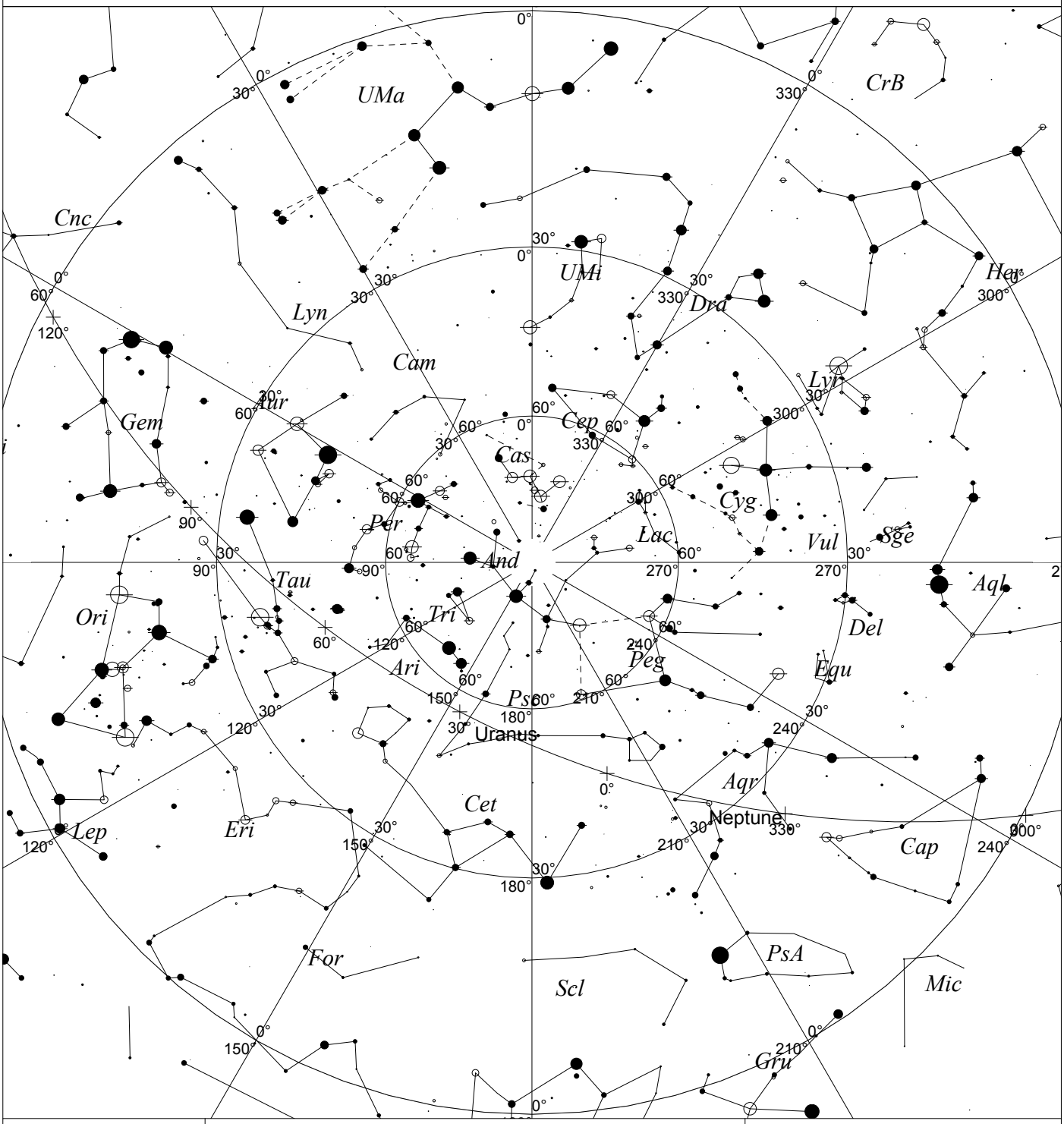
Buffalo 10/19/2017 23:00:00



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3	Bright nebula	Quasar	
3.5			
4			
4.5			
>5			

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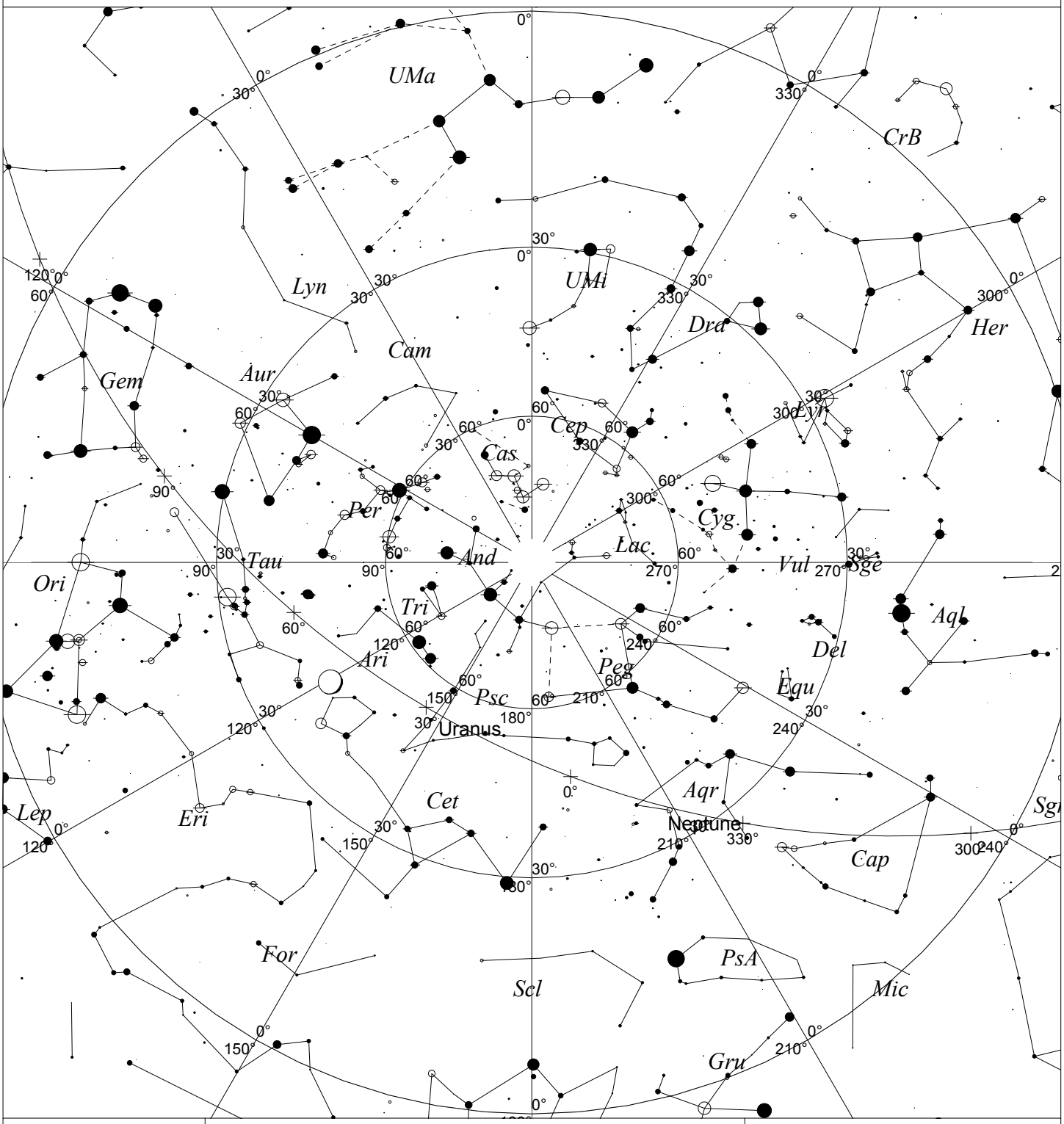
Beaver Meadow 10/7/2017 23:00:00



STARS	SYMBOLS	
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1.5 · 4	Variable star · Globular cluster · X-ray source	
2 · 4.5	Comet · Open cluster · Other object	
2.5 · >5	Galaxy · Planetary nebula	
3	Bright nebula · Quasar	

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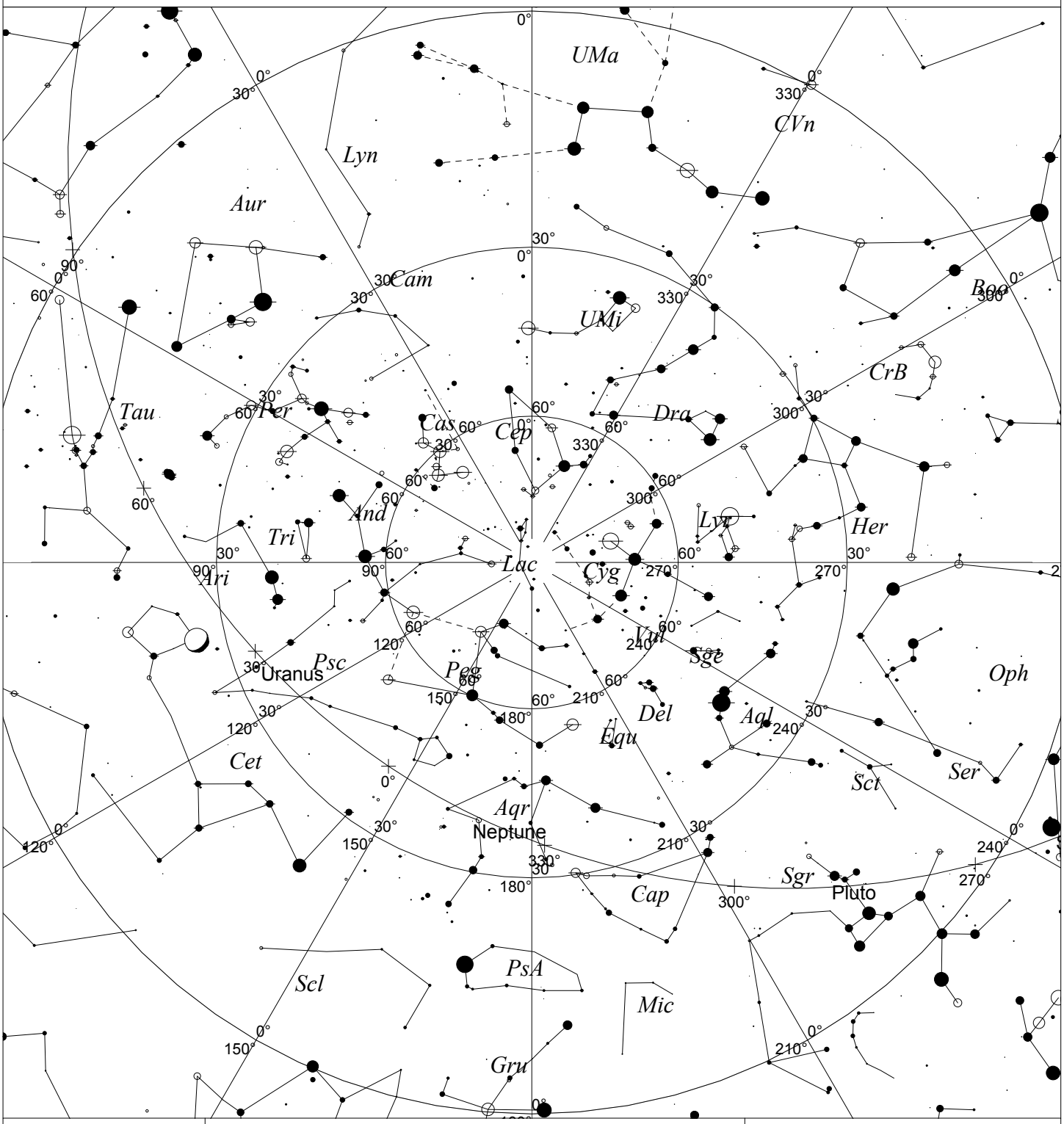
Wilson Star Search 9/9/2017 23:00:00



STARS	SYMBOLS		
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1.5	Variable star	Globular cluster	X-ray source
2	Comet	Open cluster	Other object
2.5	Galaxy	Planetary nebula	
3	Bright nebula	Quasar	
3.5			
4			
4.5			
>5			

Local Time: 23:14:40 9-Sep-2017 UTC: 04:14:40 10-Sep-2017 Sidereal Time: 22:16:55

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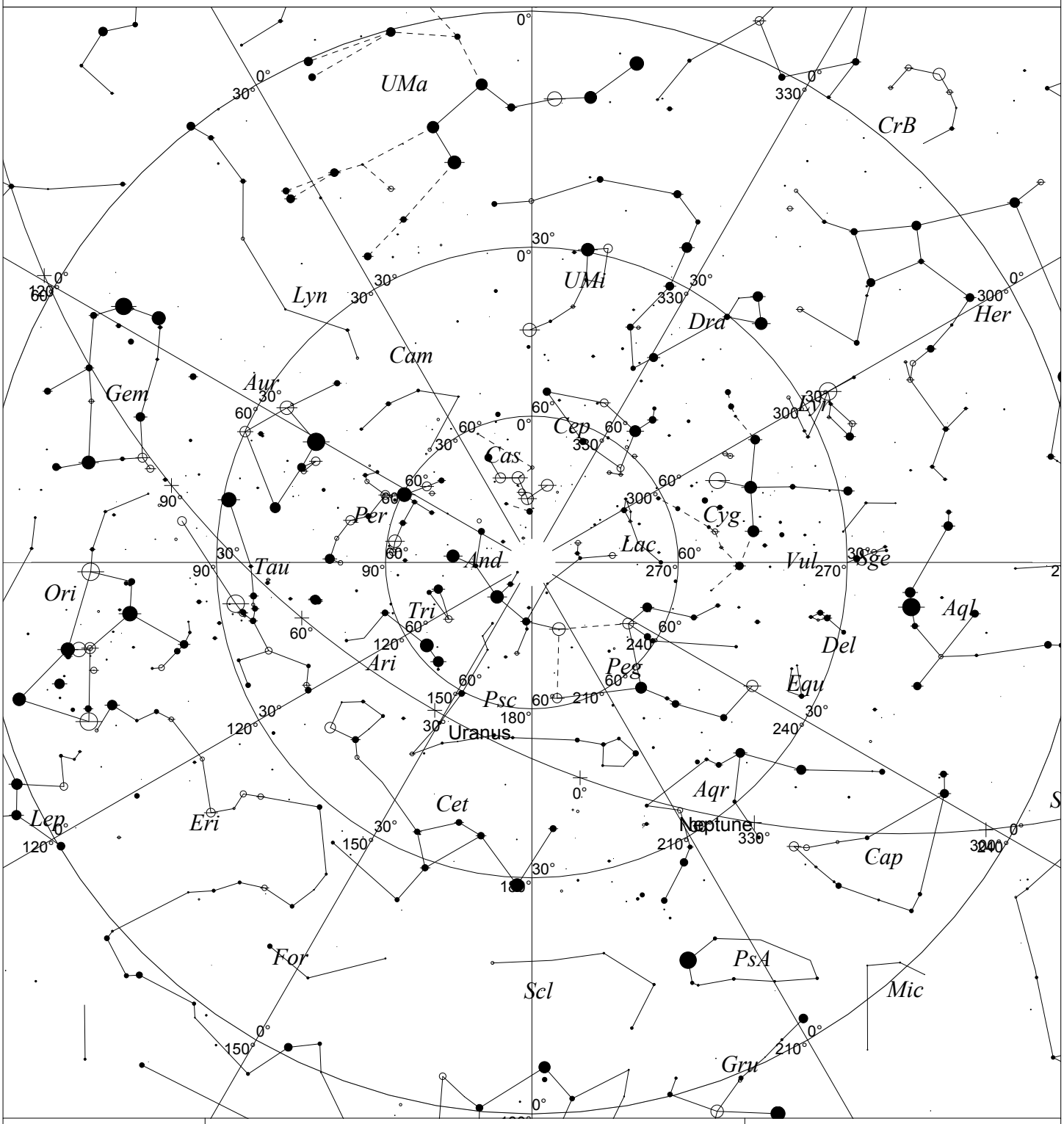
Wilson Star Search 10/14/2017 23:00:00



STARS	SYMBOLS		
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1.5	Variable star	Globular cluster	X-ray source
2	Comet	Open cluster	Other object
2.5	Galaxy	Planetary nebula	
3	Bright nebula	Quasar	
3.5			
4			
4.5			
>5			

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THE BUFFALO ASTRONOMICAL ASSOCIATION

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- A monthly kids meeting, site orientation meeting, and general meeting with speakers of interest. Access to meeting videos on the BAA web site. - Opportunities to participate in programs that promote astronomy to the general public (such as Star Parties)
- Meet other amateurs and share experiences, learn techniques, and swap stories.

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