Newsletter of
The Black River Astronomical Society
Guidescope

Lorain County, Ohio **March 2018**
Website: blackriverastro.org **Newsletter submissions: Editor**

--Wednesday, March 7, 7 p.m.: Regular meeting, Carlisle Visitors Center. Dr. Dan Stinebring on latest gravity wave research

--Thursday, March 15, 7 p.m.: Board meeting, Blue Sky Restaurant, Amherst

--Friday, March 16, 8-10 p.m.: Public observing, Nielsen Observatory (cloud backup date Saturday, March 17, 8-10 p.m.)

--Friday, March 23, 8-10 p.m.: Public observing Nielsen Observatory (cloud backup date Saturday, March 24, 8-10 p.m.)

Visit Our Website

Explore if you will the informative BRAS website and all its interesting, timely links, and join the interactive members-only BRAS Forum to better keep in touch.

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Guidescope Contributions Wanted

If you have any wanted/for sale announcements, astronomical photos you've taken, interesting article links, equipment reviews, observing reports, or anything that you think the local amateur astronomy community could relate to, please send it to your humble Guidescope editor for inclusion in forthcoming issues. Many thanks.

~Bill Ruth

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BOARD SUMMARY Feb. 15, 2018

The meeting was called to order at 7:04 p.m. with six Directors present. The minutes of the January meeting were read and approved as was the Treasurer's report. Under Committee Reports, the *Guidescope* and the Website committees reported status quo. Under Instrumentation, John Reising reported that at the last Public Observing session, the black C-14 had operated well and that the observatory seemed to be wintering well. Under OTAA, Jeff Walsh reported that he is readying the door prize request letters that he will start sending out within a week or so. The Metro Parks Liaison had no report.

Programming is set for the year with only two slots currently open. The monthly programs are as follows:

March	Dr. Dan Stinebring	The latest research on Gravity Waves
April	Dr. Rob Owen	T.B.A.
May	Bill Ruth	Binocular Astronomy
June	John Reising	Mars and the upcoming opposition
July	Mickey Hasbrook	Lowell Observatory
August	Denny Bodzash	Solar Superstorms, EMP Attacks and Hardening the Grid
September	OPEN	
October	Elections, Annual Meeting of the Members, short video	
November	OPEN	
December	Annual Holiday Pot Luck at Amherst Beaver Creek Reservation	

Old Business came next with the first item, the reminder that our May Solar Observing session will be our participation in the Metro Parks Paddle and Pedal Festival at Lakeview Park on Sunday May 20th from 11:00-3:00 p.m. Our second Solar Observing session will be our participation in the World Wide Solstice Festival on Sunday June 24th at Sandy Ridge from 1:00-4:00 p.m. We had attempted to have the Festival at Lakeview Park where it has been held before, but our date conflicted with a large beach volleyball tournament and there was not room for us. Tim Fairweather at Sandy Ridge was kind enough to volunteer to host us instead. The actual Solstice is mid week, and we had a choice of the weekend before or after the actual event and we choose the 24th to avoid other conflicts.

There was a brief discussion of filling the empty Board position, but it was decided to table the discussion for another day.

Next, the discussion turned to getting the orange tube C-14 serviced. As members may remember, there is a spot of what looks like mold on the inside of the corrector plate that obviously can not be allowed to grow and etch the plate. John Reising, our Instrumentation specialist, will contact Celestron for a rough estimate on cleaning and general service. Once we have at least a starting estimate, we will contact the Metro Parks for permission to send the telescope in for service. It may be remembered that the black C-14 belongs to the club, while the orange scope belongs to the LCMP.

The final item of Old Business was a reminder to the Board that we are participating in the Avon Lake Parks and Recreation “Dark Skies, Bright Kids” event on Friday 2/23 from 6:00-9:00 p.m. The event is at a different venue, being held at the Anchor Recreation Facility on Lake Road. Greg and Debbie Zmina, Jeff Walsh, Mickey Hasbrook, Dan Walker, and Steve Schauer have committed to attending, and will discuss the Sun, the solar system, types of telescopes, and will hand out club information. If it is clear, we will also do outside viewing.

New Business came next, with the first item being a discussion of the Keystone Elementary School Science Night scheduled for Friday March 16th starting at 6:00 PM. This is the second year for the event and we enjoyed ourselves last year. Our participation this year is complicated by the fact that we have Public Observing on the same night. So far, Greg and Debbie Zmina and Mickey Hasbrook have committed to attending the Keystone event, and Jeff Walsh and Steve Schauer have committed to be at the observatory. Others, it is hoped, will be added later.

There was also a brief discussion about a program at the Lorain South Library (South Branch) that they requested. Dan, Greg Z. and Jeff will work with them to decide a date and time and to refine what kind of program to present. We hope to do an inside program followed by some outside observing if the weather cooperates.

The final act was the pleasant task of voting in new members. We welcome Betty Jo Hoyt and Mike Meyer, both of Huron, to the club! We are delighted you have joined us!

Dates were set, and the meeting was adjourned at 8:27 p.m.

~Steve Schauer

Reflections on the Past that Should Be Known in the Present

Monday February 12th started out as a normal day and turned into a reflection and remembrance of the past.

I received a phone call Monday afternoon from a person wanting to get in touch with the Black River Astronomical Society, wanting to know about a telescope—a 1978 Standard Duplex Questar.

Since I own a 1969 Duplex Questar we got into a long talk about Questars, and cameras (he was a Cleveland commercial photographer and about to retire at age 74). Suffice it to say he had used the same cameras as I have, both film and digital.

He then got to the part about how he came into the Questar.

He was not into astronomy or astronomy clubs but as a pro photographer knew of Questar, as I did, ever since they have been in production, from 1954 to the present. At a McDonald's he frequented for morning breakfast he noticed a car one day in the lot with the vanity plate QUESTAR, so he had to meet the owner of that car. It turned out to be a man named Dale Chapman who was, a long time ago, a member of the BRAS and a friend of my mentor and fellow club member George Diederich. He left the club long ago, but if you've attended any of the OTAA star parties of the past, especially the Mahoning Valley Astronomical Society OTAAs, if you saw a Questar set up for solar observing it was Dale's.

I came to admire his scope and did get to know Dale, and saw him at MVAS and a few times at Chagrin Valley Astronomical Society star parties.

This is how reflection on the past comes sharply into view. A doctor, who long-time BRAS member Larry Janowicz worked with, recently passed away, and his estate sale had my now-acquired-from-Larry Questar.

Sad to say, I was told Dale Chapman had passed away last year, so that is how the photographer friend got his Questar, passed on to the next owner, and Dale and the photographer were friends. That's very similar, but different at the same time, from how an earlier model of Questar got into my hands.

A reflection of the past so strong in my mind: I will remember Dale and his passions, and his introducing me to the Questar. Rest in peace, old acquaintance.

~Michael Harkey

Love this time of year for my favorite constellation... Orion. It's there in plain sight at a reasonable hour. Last night, the sky was clearer than most nights for a long time. The Orion Nebula wasn't visible without help but this time I used a straight DSLR, no telescope. I was delighted. The photo is from my yard (terrible light-pollution). This is the 1st skywatch for me in about 6 months. It was good to get out.

The challenge in photographing the Orion Nebula is that the center is very bright compared to the surrounding gas. Trying to capture the nebula color makes the center wash out. Trying to capture the star detail at center (Trapezium) makes the surrounding nebula very dim and flattens color. At other times, I have taken multiple exposures and combined them into a single, more representative shot.

Camera: Canon T3i w/ 500mm mirrored lens at fixed f-6.2 aperture. Exposure was 1.3 seconds at ISO 12800. Resolution: 20meg. Color saturation, contrast, gamma and digital noise manipulated. Frame size reduced.

~Len Jezior

2019 NASA Budget Request Unveiled

On February 15, the Trump administration revealed its 2019 budget request for NASA. The overall budget for NASA, is the president gets his way, will be $19.9 billion, up $500 million from the proposed 2018 budget, which still has yet to be funded. Delving into the details, there are several key points worth a closer look.

One major aspect of the bill sure to bring cheers from space enthusiasts is the fact that, if the president gets his way, roughly half of NASA's budget will go to manned spaceflight, whose now official set goal under President Trump is to return Americans to the Moon and to establish a long-term presence there. Purposes? Scientific research and Moon mining.

Closer to home, the budget also allots $150 million to encourage private industry to take over the low-Earth orbit arena. This trend began under President Obama and would accelerate under President Trump. NASA already has many contracts with private industry, most notably SpaceX, which now supplies the International Space Station (ISS).

Speaking of the ISS, probably the most controversial part of the budget request would be the severing of government funding to the ISS following the 2024 fiscal year. Texas Senator Ted Cruz, a Republican, is highly opposed to the idea of defunding the ISS and has made his opinions clear before the budget was even made public, citing the United States' investment (nearly $60 billion) and science the station has produced. On the other hand, the Station's future is uncertain. Initially designed for a 15 year orbital life, the ISS is now about to celebrate it's 20th birthday and would be 28 years old in 2024. Can it go that far? Who's to say, the ISS now holds the record for longest-lasting space station, a record it extends one day at a time. The ISS is truly going where no space station has gone before.

Also getting the cut are research and educational activities. While continuing to fund the James Webb Space Telescope, the budget would ax a successor to Hubble, which was intended to be a wide field infrared telescope. Also getting cut are 5 planned Earth science missions, along with NASA's Office of Education, whose main purpose is public outreach.

At this point, it is important to note that the request is just that, a request. Ultimately, it will be up to Congress to decide how the money is doled out as all spending bills must originate there, not with the White House.

~Denny Bodzash

FACTS ABOUT TELESCOPE MAGNIFICATION

The telescope is often thought to magnify celestial objects too far away to view unaided. While this is true to a point, the fact is that the telescope's primary purpose is to collect light. The reason we can't see many celestial objects isn't because they're too distant or tiny, it's because they're too dim. If we could see the Andromeda Galaxy or Orion Nebula in full illumination, it would appear larger than the full moon. The larger the primary objective (aperture or iris), the more light can be captured, the brighter the view. Advanced technology offers yet even more enhancement to this fundamental premise... electronic light detectors, that is, digital cameras, more sensitive to light and able to accumulate the light received. Having said that, we turn to the issue of magnification.

Some definitions first... "Magnification" is mathematically defined in a number of ways, some by complex formula, others quite simple. For the sake of expediency, we'll use "simple". The term most often used to identify magnification is "Power", symbolized by the letter "X" otherwise termed "Times". "1X" is what the human eye normally sees. "2X" is twice, or 2 times normal image size. The objective is to make an image appear larger.

Excluding space based telescopes and mountain top super-scopes, most professional and amateur astronomers agree on the following table as "Best Range of Telescope Magnification"...

For	Power
Lunar, Solar & Sky	50x or less
Deep Space Objects	50x ~ 150x
Solar System Planets	150x or more

Magnification should be increased only to enhance detail. The more magnification used, the less light reaches the eye (or camera) and the more distortion is enlarged as well. Large scopes can magnify more because the pool of light is large enough to sacrifice for the sake of "bigger" over "brighter". However, a "bigger" image isn't necessarily better.

Every telescope has a limit to how much magnification it can accommodate. Beyond that limit, the image becomes so dim and blurred as to become irresolvable. Though the following formula isn't exacting, it is useful and true.

If the scope is measured in millimeters...

Max Mag = Aperture X 2 (Ex; A 150mm mirror or lens supports a maximum of 300x power.)

If the scope is measured in inches...

Max Mag = Aperture X 50 (Ex; A 4" primary mirror or lens supports a maximum of 200x power.)

Binoculars are rated somewhat differently as their lenses are not changeable. Ratings are given by a set of 2 numbers identifying both power and millimeter size of the primary objective. It gives the

buyer/user some idea of what to expect in terms of both big and bright.

Getting back to telescopes, they're rated by focal length or *f*-number (not to be confused with *f*-stop). The focal length indicates how far light must travel from the primary objective to the eyepiece that is, how much light is presented at the eyepiece. The *f*-number is determined by dividing the telescope's focal length by the telescope's primary aperture or objective size. The smaller the telescope's *f*-number, the more light is reported by the rating. Lower numbers facilitate dim objects such as deep space targets like nebulae. Higher rating numbers serve better resolution for observing planets and double stars.

The magnification ratings are defined by dividing the telescope's focal length (in millimeters) by the eyepiece focal length. We can see that by changing the eyepiece, we change magnification. The lower the eyepiece focal length, the higher the magnification. In doing this, remember the maximum power rating of the telescope. The telescope's magnification is increased this way, but as the telescope's limits are approached, the image becomes less clear.

Using today's CCD camera technology, even a simple webcam can be modified to enhance a telescope's light capturing ability. A camera mated directly to the telescope, will act as a 10mm to 15mm eyepiece. Using a camera may require employing additional optics to reduce the telescope's focal length. This may be necessary to keep the imaging train within the telescope's magnification limits.

Lastly, a word about using Barlow Lenses. Their function is to act as a focal length multiplier. A 2X Barlow multiplies the focal length by 2, resulting in doubling magnification. This arrangement, however, will square the amount of light reduction. A 2X Barlow reduces light to 1/4th... a 3X to 1/9th, a 5X to 1/25th, etc. This is a huge reduction in light. If the scope can't collect a sufficient amount, the image will be extremely dark, greatly increasing time exposure or becoming too faint to be seen by the naked eye.

In summary...

- Establish the telescope's magnification limits.
- Select an appropriate eyepiece best suited for the intended observation.
- Exceeding the telescope's power limits severely degrades image quality.
- The CCD digital camera is the newest of tools to enhance the telescope's light processing performance.
- Increase magnification only to improve detail. An image train is only as good as its weakest component. Magnification reduces light and amplifies both detail and distortion.
- There's no substitute for quality. However, more $$$ isn't always necessary if you understand the function enough to make the adjustments.

FORMULAE

L: Telescope Focal length AP: Width of telescope aperture (Primary Objective)

X: Power AP: Aperture EP: Eyepiece L: Telescope Focal Length

F-Number

$f = L_{mm} / AP_{mm}$

Maximum Usable Power

$X_{max} = AP_{mm} \times 2$ -or- $X_{max} = AP" \times 50$ $EP_{mm} = L_{mm} / X_{max}$

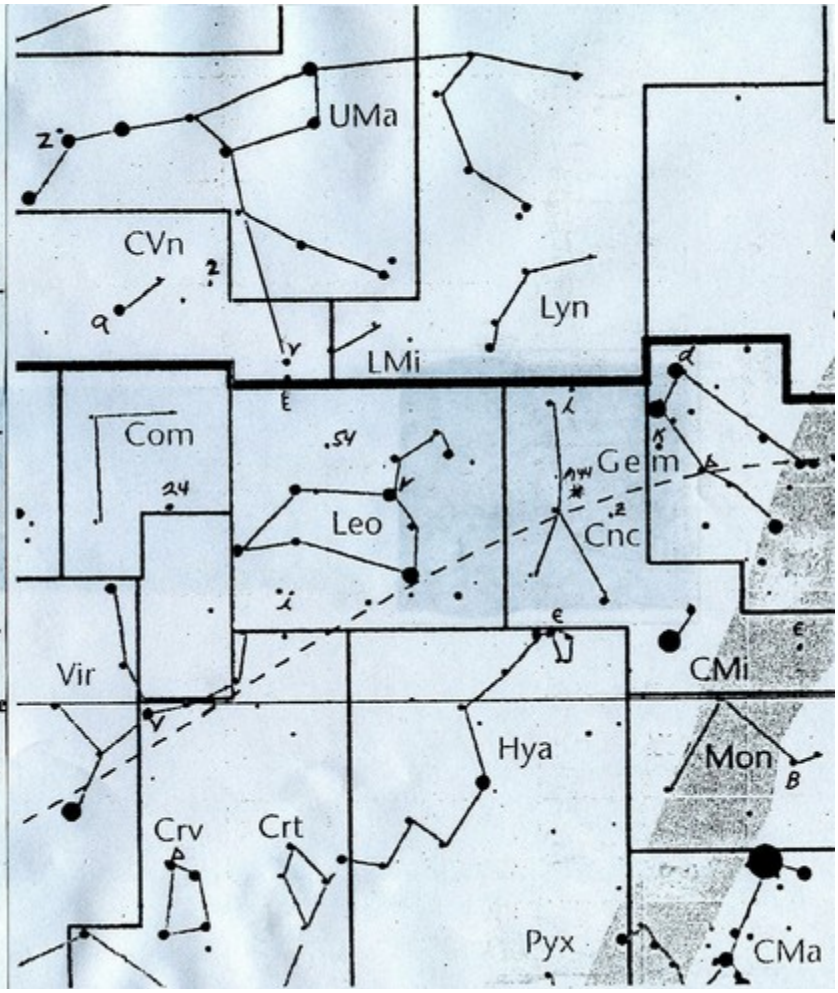
Magnification (Power)

$X = L_{mm} / EP_{mm}$

~Len Jezior

SPRING BINARY STARS

ID	MAGs	SEP (")	COLORS (Spectrum)
α Gem (Castor)	1.9, 2.9	4.3	A, A white
δ Gem	3.5, 8.0	6.3	F, A
κ Gem	3.6, 9.4	7.1	G, A yellow
ε Mon	4.4, 6.6	12.3	A, F
β Mon	5.1, 5.4	3.0	B, B blue
	4.6	8.3	B
ε Hydra	3.4, 6.9	2.9	G, F yellow
ζ Cancer	5.6, 6.0	1.0	F, G
	6.1	6.2	G
ι Cancer	4.0, 6.5	30.5	G, A yellow
α Leo (Regulus)	1.5, 8.0	176.0	B, A blue
γ Leo	2.3, 3.5	4.4	K, G yellow
54 Leo	4.5, 6.3	6.6	A, A white
ι Leo	4.1, 6.7	1.7	F, G
ξ UMa	4.3, 4.8	1.7	G, G yellow
α CVn CorCaroli	2.9, 5.5	19.3	A, F
2 CVn	5.9, 9.0	11.5	M, F red
ζ UMa Mizar	2.3, 3.9	14.4	A, A
24 Coma	5.0, 6.6	20.3	K, A orange
γ Virgo	3.5, 3.5	0.8	F, F***
δ Corvus	3.0, 7.5	24.2	A, K



Courtesy of John Reising

Deep-Sky Objects for March

Objects for Binoculars							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$08^h13.1^m$	-05°48'	M48	m5.8v	54'		Hya	Open Cluster, 80 stars
$08^h40.1^m$	+19°57'	M44	m3.1v	95'		Cnc	Open Cluster 50 stars, "Beehive or Praesepe
$08^h50.4^m$	+11°49'	M67	m6.9v	29'		Cnc	Open cluseter 200 stars
$08^h46.7^m$	-28°46'	48 (Iota-1)	4.2, 6.6	30.5"	307°	Cnc	Double Star
$13^h23.9^m$	+54°56'	79+80 (Zeta)	2.3, 4.0	14.4"	150°	Cnc	Double Star
Objects for Small Telescopes (2-6 inch)							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$06^h26.8^m$	+58°25'	5 Lyn	5.3, 9.8	31.4"	139°	Lyn	Triple Star (3^{rd} star 7.9, 96". 272°)
$08^h52.7^m$	+33°25'	NGC 2683	9.8v	8.4'x2.4'		Lyn	Galaxy, type SA(rs)b II-III
$09^h55.6^m$	+69°04'	M81	m6.9v	24.0'x13.0'		UMa	Galaxy, type SA(s)ab I-II
$09^h55.8^m$	+69°41'	M82	m8.4v	12.0'x5.6'		UM	Galaxy, IO
$10^h24.8^m$	-18°38'	NGC 3242	m7.8v	>16"		Hya	Plan. Neb. "Ghost of Jupiter"
Objects for Medium-Size Telescopes (8-14 inch)							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$08^h26.8^m$	+26°56'	23 Cnc (Phi-2)	6.3, 6.3	5.1"	218°	Cnc	Double Star
$08^h33.4^m$	-16°09'	NGC 2610	m12.8v	37"		Hya	Planetary Nebula
$08^h48.3^m$	+00°33'	OE194	7.3, 10.8	12.6"	56°	Hya	Double Star
$08^h49.2^m$	+60°13'	NGC 2654	m11.8v	3.8'x0.7'		UMa	Galaxy, type SBab: sp II-III
$09^h10.3^m$	+07°02'	NGC 2775	m10.1v	4.6'x3.7'		Cnc	Galaxy, type SA(r)ab
$09^h31.5^m$	+63°04'	23 UMa	3.7, 8.9	22.7"	270°	UMa	Double Star
$09^h32.2^m$	+21°30'	NGC 2903	m9.0v	12.0'x5.6'		Leo	Galaxy, type SAB(rs)bc I-II
Objects for Larger Telescopes (16-inch & larger) Challenge Objects							
RA	Dec	Number	Mag(s)	Size/Sep.	PA	Const.	Type of Object
$07^h38.1^m$	+38°53'	NGC 2419	m10.3v	4.1'		Lyn	Glob. Cl. "Intergalactic Wanderer"
$08^h14.7^m$	+49°04'	NGC 2541	m11.8v	7.4'x3.3'		Lyn	Galaxy, type SA(s)cd
$08^h54.2^m$	+08°55'	PK219-31.1	m12.0v	>980"		Cnc	Planetary Nebula (use O-III filter)
$08^h54.2^m$	+30°35'	57 Cnc (Iota-2)	6.0, 6.5	1.4"	316°	Cnc	Double Star
$09^h19.8^m$	+33°44'	NGC 2832	m11.9v	3.0'x2.1'		Lyn	Galaxy, type E+2: (In Abell 779 galaxy group)
$09^h45.7^m$	-14°20'	NGC 2992	m12.2v	4.0'x1.2'		Hya	Galaxy, type SO pec sp
$09^h45.8^m$	-14°22'	NGC 2993	m12.6v	3.3'x1.8'		Hya	Galaxy, type IO? Pec

Print and use the Deep-Sky Interest Group - Observation Form to record your observations.

Courtesy of Len Jezior

Venus and Mercury, 3/2/18. Canon SL1 on a tripod. 800 ISO with a zoom lens between 100 and 200 mm. Less than 1 second at f/4. ~Dave Lengyel