Charcoal drawing by Władysław T. Benda 1918, depicting Earth and Moon with Milky Way, watched by veiled and robed figures, (Page 10).

Monthly Meeting November 9th at 7:00 PM, in person, masked!

(Monthly meetings this September, October and November are on 2nd Tuesdays at Highland Road Park Observatory)

You can also join this meeting via meet.jit.si/BRASMeet

PRESENTATION: Melanie Templet will speak about Chaco Canyon, an International Dark Sky Park in New Mexico.

What's In This Issue?

***OBSERVING NOTES* - Andromeda – The Chained Maiden**

Like this newsletter? See PAST ISSUES online back to 2009
Visit us on Facebook – Baton Rouge Astronomical Society

BRAS YouTube Channel

President's Message

And here we are, rounding the corner of 2021 into the holiday season. Before we know it, Thanksgiving will be upon us and then it'll just be full tilt into the new year. Thankfully, it looks like we'll have a little bit of fall like weather between now and the unpredictable winter. But, more definitely, we'll at least be done with the dreaded Daylight Time—at least until the spring, when it'll show up roused like a hungry bear looking to devour our evening observing time and reak it's havoc on our sleep patterns.

We've got a few events worthy of note coming up over the next month so check the schedules below for what looks interesting. We'll have our fall MOON night on the Friday after Thanksgiving, which I hope a lot of people will be interested in: either bring your own scope out to HRPO or come see what everybody else is looking at (or, for that matter, just come hang out and talk astronomy with your fellow enthusiasts). Coming up before that, it's worth noting that we'll be hosting our annual Natural Sky Conference on the fifth of November at HRPO, which is a great way to further our goal of educating people about the problem with light pollution, and perhaps encourage them to help with reducing it. Another way to help with the light pollution problem is to join the Globe at Night program—for which details are below (this is a super easy way to help, and is really just a matter of spending a few minutes looking at constellations and matching what you see to an image they provide).

December will be a big month for BRAS since it will mark 40 years since it officially became an institution. To celebrate, we're holding at lest two events: one for the public and another just for the membership. We're hoping to have a great retrospective on the early years and some of the events we've hosted since then, as well as a glimpse of what we hope to be doing next. It should be a good time, and we hope a lot of you can make it out for that one. The club party will be concurrent with our annual end-of-year potluck, and our election of next year's club officers, so it'll be an especially good time to come on out—if only for cake.

Speaking of what's coming next, we had a good meeting with the top brass over at the Astronomical League last week about our plans for the forthcoming 2023 Astronomical League Convention we'll be hosting. So far, they're liking what they're seeing and are planning an inspection trip for next month to finalize hotel selection. It's really shaping up, but we still need a lot of help, so contact Steven Tilley to find out what you can do.

I'm hoping a lot of you manage to find your way over to the annual Deep South Star Gaze the first week of November—so far the forecast actually looks pretty good. For those of you who have been missing hosting our own stary party, rest assured that we are too and we've started trying to find a good place. Right now, Don is spearheading our effort. We had originally thought 2022 would be a good time for the next one, but, well, 2021 was a bit of a wild card so it looks like we might have to push the date to 2023. To sate the appetite though, let us know if anybody might be interested in setting up a weekend camping trip to a local national park, which might help us find skies a little darker than our own dark sky site can afford, at least for a night or two.

Lastly, it's worth mentioning that we are still trying to liquidate some of our excess equipment, in particular, a few rather bulky reflectors that are taking up a lot of our storage space. Beginning next year, we're going to start listing these pieces on public forums, so if you've had your eye on something, now is the time to make us an offer. There's a lot of good equipment in there, so ask us what's available.

And that's it. Give the newsletter a scan and see what speaks to you. Oh, one last note: beginning with the November meeting, we're going to make sure HRPO stays open for member observing for a least a few hours after our scheduled program concludes on general meeting nights (provided there's interest, of course).

Scott Cadwallader, President 2021

MONTHLY MEETING MINUTES – October 12, 2021

in person at HRPO, live-streamed on YouTube, and remotely via Jitsi

The speaker was Amy Northrup and her subject was the NASA Lucy Project – a twelve year mission to investigate Trojans at the L4 and L5 positions.

General Meeting:

- Training Sessions: Working on "Learn to Use Your Telescope" for electronic controlled telescopes. Night Sky kit training is to be determined.
- MOON Night will be on November 26th – the Friday after Thanksgiving.
- BRAS 40th Anniversary – there will be two parties at the same time – HRPO's Preview Party and the BRAS Party.
- Call for nominations for next year's officers.
- Outreach: There are three outreaches on October 23rd. First is the Mini Maker Faire at the Goodwood Library from 10 AM to 2 PM. Second is a Boy Scout event at Lamar-Dixon from 4 PM till ? Third is the BR Mid-City Makers Market at Circa 1857.
- HRPO News from Chris K: HRPO ready to help with the BRAS 40th Anniversary Party. An electric generator (for back-up power during outages) will be installed in 2022. The dome has had a work order open for four years.
- ALCon 2023: Committee meeting will be held on Saturday, October 16th, at Coffee Call. Committee chairs to be selected. There is a need for good writers and people who can make videos. There is a need for a licensed drone operator to make aerial videos. Impromptu meetings of committees are ok. All documents for the ALCon 2023 are on Google Docs – download the documents so there will be backups in case of a problem. There will be an online meeting with AL Officers this month. Steve will issue a link for online sub-committee meetings.
- Natural Sky Conference will need volunteers.

Thomas J. Halligan

Minutes submitted by Thomas Halligan, Secretary, typed up by John Nagle

2021 Officers:

President: Scott Cadwallader
president@brastro.org
VP:
vicepresident@brastro.org
Secretary: Thomas Halligan
secretary@brastro.org
Treasurer: Trey Anding
treasurer@brastro.org

BRAS Liaison for BREC:
Chris Kersey
BRAS Liaison for LSU:
Greg Guzik

Committees/Coordinators:
AL Awards
Merrill Hess
Lightpollution@brastro.org
John Nagle
Newsletter@brastro.org
Michele Fry
Observing@brastro.org
John Nagle
Outreach@brastro.org
Ben Toman
Webmaster@brastro.org
Frederick Barnett

Business Meeting Minutes – October 27, 2021

remotely via Jitsi thru November

(meeting is the last Wednesday of the month)

The following items were discussed:

1) Discussion was had about using the money saved by not buying a zoom license for two years during remote meetings to purchase a library telescope. Universal consent was given and the motion was forwarded to the club for consideration.
2) BRAS star party is in the works but implementation has been pushed to 2023 due to ongoing concerns about public health and the proposed location.
3) Ben will start NSN training courses after the new year.
4) Plans were finalized for the assignment of HRPO keys to trustees.
5) Ben discussed future outreaches: no new volunteers for BSA event in November (conflicts with Deep South, perhaps), White Light night will need volunteers--its a large event
6) Ben will make inquiries about sidewalk astronomy at Perkins Rowe
7) EP photography policy at HRPO is under review
8) Work is being made to render the 16" and small dome operable--has wheelchair accommodations for patrons
9) Night Sky Conference invitees have been set on BREC's side, John Nagel has been told to relocate the new light pollution model pieces to HRPO
10) BREC seems to be having trouble registering new volunteers for HRPO
11) Party planning is being made by John Nagel, media should be contacted for public party, cake should be found
12) HRPO and BRAS will be at an event for the BREC 75th on December 18, Chris hopes that they can cover the launch of the Webb at the event.

Meeting ended at 8:28 PM, with 6 attendees.

Minutes submitted by Thomas Halligan, Secretary, typed up by John Nagle, reorganized by Scott C.

BRAS Outreach Report

Hi Everyone,

We can give ourselves a good pat on the back for surviving the busy October 23rd Saturday outreach extravaganza! In particular, let's thank those members that come out to volunteer and make our participation possible. The list is long: Natalia B., Chris and Annette R., John N., Roz R., Scott C., Coy W., Chris K., Craig B., Steven T. and Ben T.

Also, an extra special thanks to Chris and Annette R., Scott C. and John N. who pulled double duty by helping out at both the Maker Faire and then later at the Boy Scout camp out. (Unfortunately, Rob, the Bringer of Clouds, has kept up his reputation and the Saturday evening sky viewing for the Boy Scouts got clouded out. One of these days, Rob will get some luck for an observing event!!)

Finally, we have a couple of upcoming events (and one more pending that I will get out as soon as I get the details.) It may be too late to volunteer for the Boy Scout event, but maybe not. Please let me know if you'd like to try.

Coy, Craig and John educating some patrons at the Maker Faire!

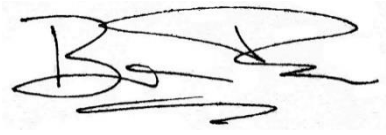
Coy shows some kids a solar flare using his H-Alpha scope and an astro-video camera hooked to his laptop.

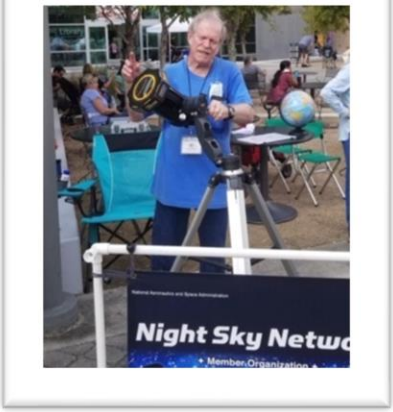
Saturday, November 6th
Afternoon-Evening
Avondale Scout Camp (Clinton, LA)
Solar and nighttime telescope viewing
(Possible to camp overnight in this dark sky, but as stated in an earlier email, you need to get info in by Nov 1st. which probably won't happen if you are just now seeing this.)

Friday, November 19th
6pm-10pm
White Light Night Event (Baton Rouge)
Sidewalk astronomy type telescope viewing
(This is a busy event all up and down Government St. We will set up primarily at our normal location for the Makers Market at Circa 1857 on Government.)

Again, if you'd like to help out, please let me know ASAP!

Clear Skies, Ben Toman





John with solar filter on his scope.

Nat and Roz showing an NSN kit

2023 Astronomical League Convention in Baton Rouge!

As you may know, Baton Rouge Astronomical Society has been selected to host the 2023 Astronomical League Convention (ALCon 2023); This conference will include lectures, panel discussions, workshops, an exhibition, and astronomy field trips. It will be Wednesday July 26 through Saturday July 29. This event could bring from 250 to 500 people to Baton Rouge. This is an opportunity to bring speakers we always wish for to Baton Rouge.

UPDATE: We have been talking with hotels and the Astronomical League and the plans are coming along.

Subcommittees: We are breaking up the work in small bites so no one will have too much work and one may work with a subcommittee without having to be at the full ALCon 2023 committee meetings.

- Venue & Housing
- Finance
- Publicity/Communications/Photography (this subcommittee will do a lot
- of work needs volunteers)
- Reports
- Scheduling

If you would like to help by working on a subcommittee please send an email to Steven Tilley at stevearenо225@gmail.com. *Check calendar below for details on meetings.*

ALCON 2022

July 28 – 30

EMBASSY SUITES HOTEL

1000 Woodward Pl. NE
Albuquerque, New Mexico 87102
https://alcon2022.astroleague.org/
(Website available by January 14, 2022)

Hosted by:

The Albuquerque Astronomical Society

www.TAAS.org

BRAS Light Pollution Committee Report

This committee meets at 6:00, same day as the 7:00 BRAS Business Meeting, the last Wednesday of the month. (This meeting is "in person only". All members are welcome to join.)

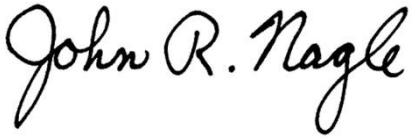
NOTICE: For October and November only, this meeting will be held at 6:00 PM on the day of the General Meeting -- October 12th and on November 9th.

- Discussed what should be sent in an update on Light Pollution to those who have signed the LP Petition. Suggestions are SQM readings, brief description of the 7-year plan, and the plans to get HRPO designated as an Urban Dark Sky Park.
- The 7-year plan is active again.
- Starting the long process of getting HRPO designated as an "Urban Night Sky Place" by IDA. Awaiting to hear from BREC.
- Sending information to Merrill H for the BRAS stand on LP to be incorporated into the BREC-LSU-BRAS agreement.
- Contacting Home Schooling groups about participating in the Globe-at-Night program.
- Will make an appointment to meet with a BREC Go Green Committee representative to discuss the BREC Environmental Sustainability Policy.
- To be contacted:
  Civic Associations -Chris K and Wally P have previously contacted them,
  LSU School of Architecture
  American Institute of Architecture (AIA) – I will contact the Baton Rouge chapter about LP,
  Civic Association groups (Nancy Curry).
- Will contact the Architect for the apartments being built, at Bluebonnet and Highland Road, about LP and lighting – it has a challenge by the Mormon Church. Need to send a letter to BREC Commissioners - member for District 3 – HRPO's (Rowdy Gaudet). Will also need to send letter to the School Board representative on the BREC commission, Connie Bernard.
- The University Lake Project has no new meetings scheduled at this time.

New Items

1. Develop a form letter to be sent for any new developments in the Greater Baton Rouge area.
2. Need to find out about the French Town Development Area.

John Nagle, LPC Chair



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Globe At Night

The target for the Globe at Night program is Grus from October 27th through November 5th, and from November 25th through December 4th.

If you would like to participate in this citizen science program, you can find instructions at

https://www.globeatnight.org

P.S. The "Loss of the Night" app can be used for information and for reporting your observations.

Upcoming BRAS Meetings:

Monthly Member Meeting –

7 pm Tuesday, November 9th at the Observatory, and via YouTube & Jitsi.

moved to 2nd Tuesdays for September, October and November only

Light Pollution Committee:

6 pm Tuesday, November 9th. (In person only, Open to the public), followed by . . .

Monthly Business Meeting:

7 pm Tuesday, November 23rd, via Jitsi (Members Only)

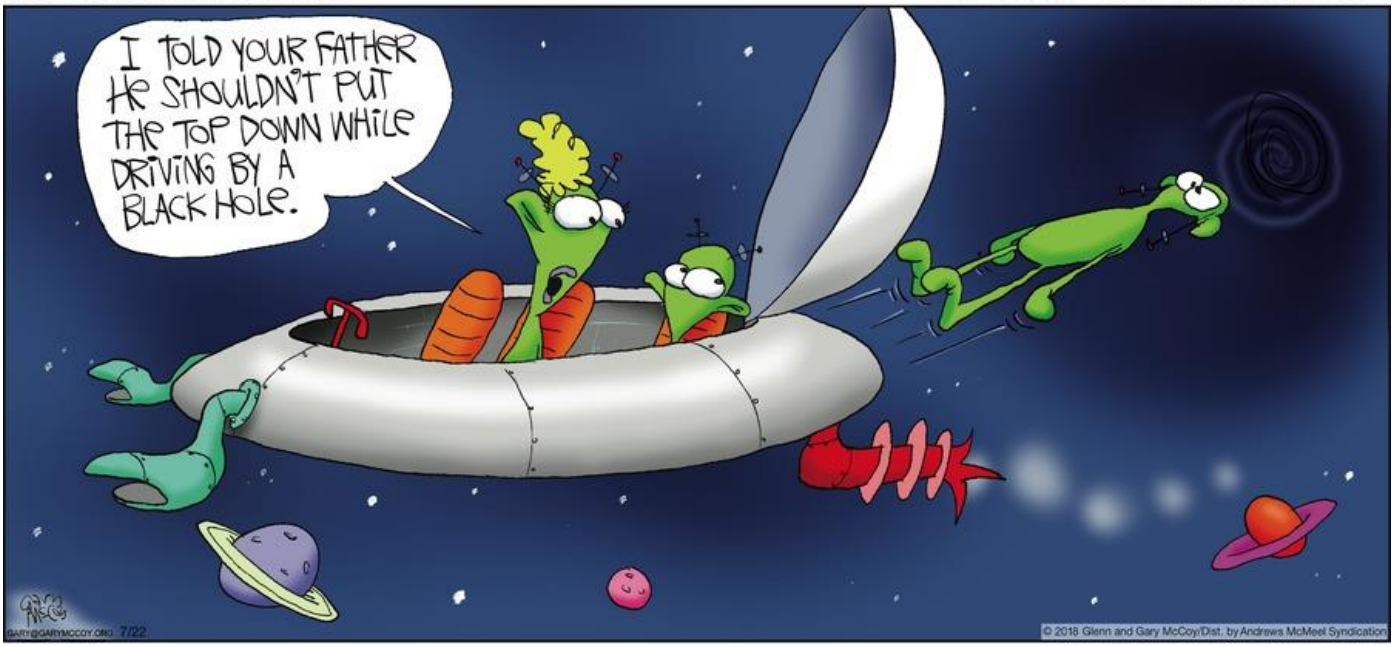
MOON (Members Only Observing Night)

November 26th

ALCon 2023 ("Astronomical Gumbo") Committee Meeting

6 pm Thursday, November 11th at HRPO

THE FLYING McCOYS BY GARY & GLENN McCOY



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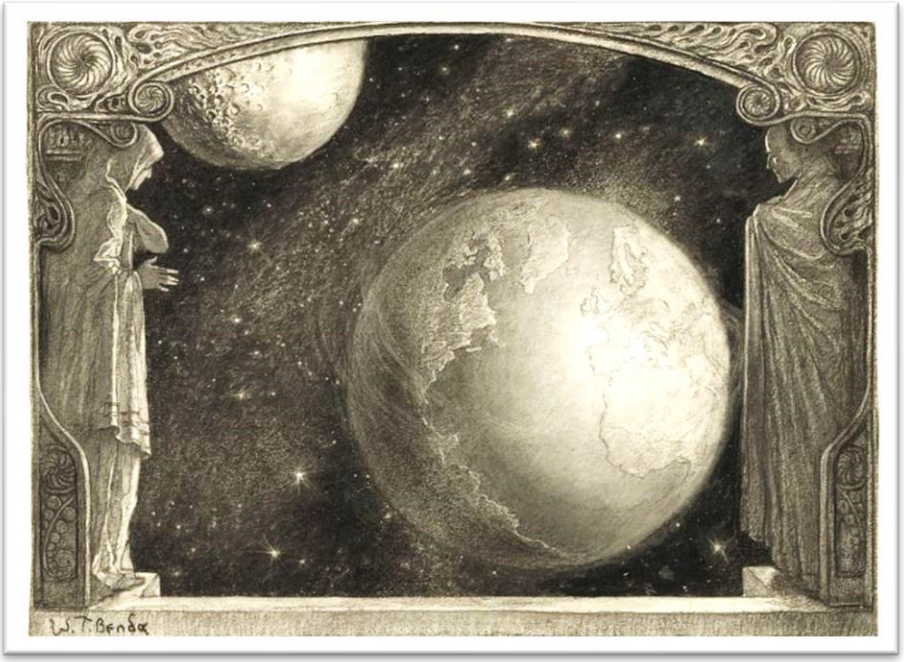
The PUBLIC DOMAIN *REVIEW*

Marxist Astronomy: The Milky Way According to Anton Pannekoek

By Lauren Collee

Can a person's experiences on earth alter how they perceive the stars? Lauren Collee peers through the telescope of Anton Pannekoek, the Dutch astronomer whose politics informed his human approach to studying the cosmos.

EXERPTS: As technologies for image-making — such as radio telescopy and gamma-ray instruments trained on the Milky Way — become more advanced, mechanical objectivity does not necessarily become more trustworthy. "The history of astronomy has been commonly narrated through the technologically determined progression of better and increased vision", writes Anya Ventura.[4] Yet because these technologies rely on a form of data gathering beyond the faculty of the human senses, there are always additional processes needed to transform their findings into something we can experience. These processes, often excluded from the public-facing narrative, are shot through with subjective decisions.



A charcoal drawing by Władysław T. Benda, depicting the earth with Milky Way and moon, watched by a veiled and robed figure, ca. 1918.

Astronomy at the turn of the century was committed to its self-fashioning as a "precision science", and doubled down on its acknowledgement of the "personal equation" problem by building vigilance, monitoring, and bookkeeping into methods (William Ashworth describes this as "an accountant's view of the world").[9] Pannekoek, by contrast, argued that the Milky Way was produced at the intersection of physical reality, the observer's eye, and the way their mind interpreted this interplay. *In A History of Astronomy* (1951), Pannekoek asks:

What really is the Milky Way? Exactly speaking, it is a phantom; but a phantom of so wonderful a wealth of structures and forms, of bright and dark shapes, that, seen on dark summer nights, it belongs to the most beautiful scenes which nature offers to man's eyes. It is true that its glimmer is so faint that it disappears where the eye tries to fix upon it—it is perceived only by the rods, not by the cones of the retina, hence is seen only by indirect vision; yet, when all other glare is absent, it gives an impression of brilliant beauty.[10]

Read the full article here:
Marxist Astronomy: The Milky Way According to Anton Pannekoek – The Public Domain Review

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Flying "Rocks" and "Dirty Snowballs":

Asteroid and Comet News

November 2021

Volume 3, Issue 9.

JPL Close Approach Data from 2021-Sep-17 to 2021-Oct-18 Distance Nominal < 1 Lunar Distance

Object	Close-Approach (CA) Date	CA Distance Nominal (LD)	H (mag)	Diameter
(2021 SP)	2021-Sep-17	0.04	29.3	3.7 m - 8.3 m
(2021 SQ)	2021-Sep-20	0.72	28.4	5.5 m - 12 m
(2021 SW1)	2021-Sep-26	0.71	29.8	2.9 m - 6.5 m
(2021 SQ1)	2021-Sep-27	0.43	28.8	4.6 m - 10 m
(2021 TT)	2021-Sep-30	0.34	27.8	7.2 m - 16 m
(2021 TX)	2021-Oct-01	0.11	31.2	1.5 m - 3.5 m
(2021 TV1)	2021-Oct-03	0.42	28.1	6.5 m - 14 m
(2021 TG1)	2021-Oct-03	0.76	28.2	6.1 m - 14 m
(2021 TQ4)	2021-Oct-06	0.99	29.9	2.8 m - 6.2 m
(2021 TT1)	2021-Oct-10	0.97	26.2	15 m - 34 m
(2021 TK11)	2021-Oct-11	0.35	28.7	4.9 m - 11 m
(2021 TT13)	2021-Oct-11	0.14	29.8	2.9 m - 6.5 m
(2021 TH15)	2021-Oct-11	0.82	28.8	4.5 m - 10 m
(2021 TE13)	2021-Oct-12	0.07	29.3	3.7 m - 8.2 m
(2021 TM14)	2021-Oct-14	0.38	28	6.7 m - 15 m
(2021 UL)	2021-Oct-16	0.09	30.3	2.3 m - 5.2 m
(2021 TJ15)	2021-Oct-16	1	28.4	5.6 m - 13 m
(2021 TG14)	2021-Oct-18	0.65	28.2	6.0 m - 14 m

As of 2021-09-23 there is
1,273 objects listed on JPL's Sentry: Earth Impact Monitoring(JPL) (https://cneos.jpl.nasa.gov/sentry/)
2,862 objects have been removed from Sentry(JPL) (https://cneos.jpl.nasa.gov/sentry/removed.html)

For more information read Jon Giorgini's "Understanding Risk Pages"
(http://www.hohmanntransfer.com/by/giorgjon.htm) (i.e. "A risk-page listing is not a *prediction* of impact")

16 objects were removed from NASA JPL's Sentry: Earth Impact Monitoring list from 2021-08-19 to 2021-09-22 see https://cneos.jpl.nasa.gov/sentry/removed.html

Useful Links:
Guide to Minor Body Astrometry (https://www.minorplanetcenter.net/iau/info/Astrometry.html)
How Are Minor Planets Named? (https://www.minorplanetcenter.net/iau/info/HowNamed.html)
New- And Old-Style Minor Planet Designations (https://www.minorplanetcenter.net/iau/info/OldDesDoc.html)

The Tracking News
(http://www.hohmanntransfer.com/news.htm)

Accessible NEAs
(https://cneos.jpl.nasa.gov/nhats/intro.html)

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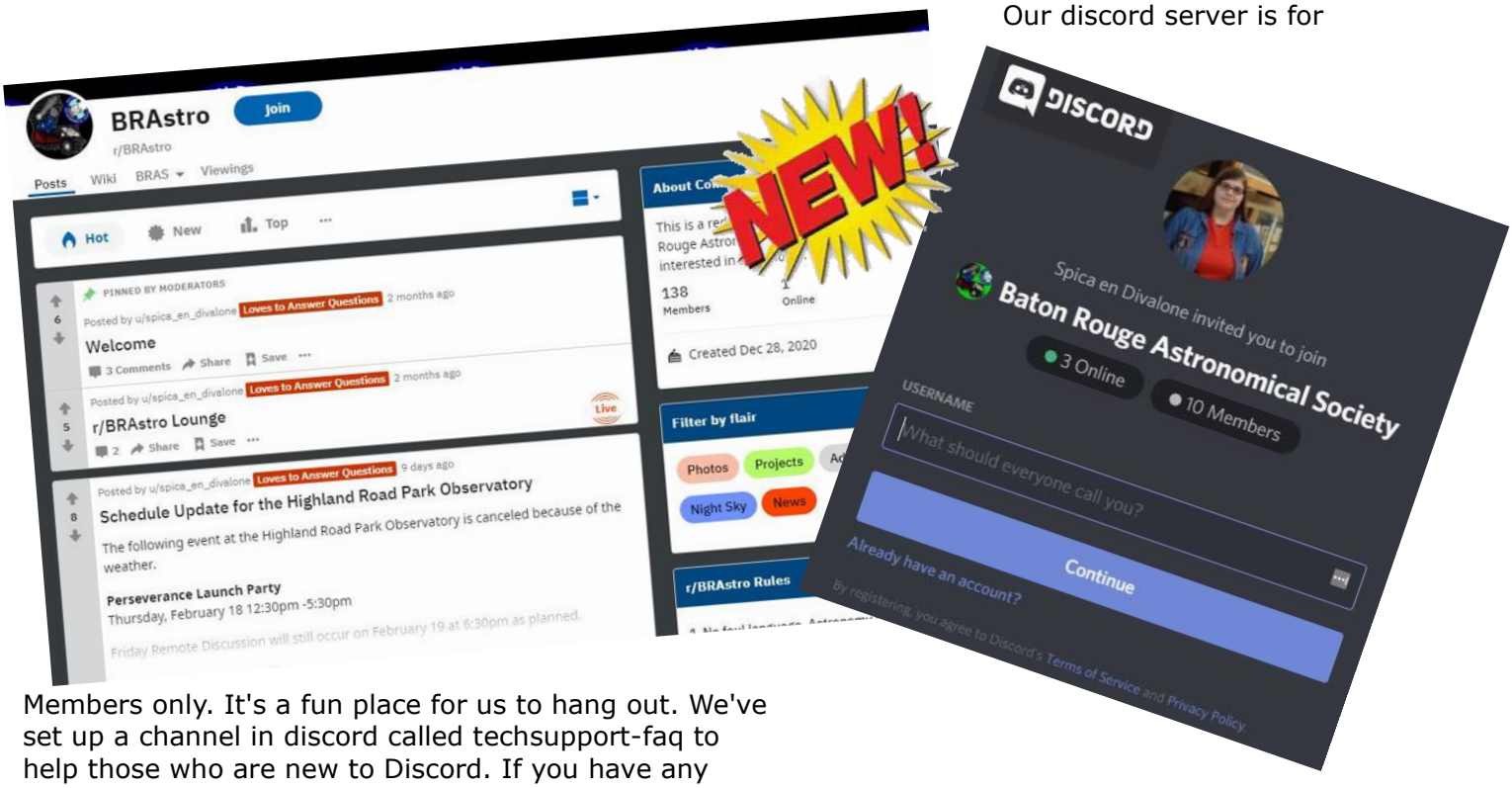
BRAS subreddit and a Discord server.

From Amy Northrup: Our subreddit has been set up for us to reach out to the public. I'd love for you to join us on there.

https://www.reddit.com/r/BRAstro/

If BRAS members want to identify themselves as club members, PM me to add a Flair next to your username.

Our discord server is for



Members only. It's a fun place for us to hang out. We've set up a channel in discord called techsupport-faq to help those who are new to Discord. If you have any problems you can message me or Justin. **https://discord.gg/6N8r8DDj** It also has voice channels so that you can speak to people through Discord. Discord requires the download of a free app.

The best part about both of these is that you can access them on your phone with the free apps. Hope to see you there.

***To** join the discord, please email **safey2007@gmail.com** with the subject **BRAS Discord**.*

Sincerely,
Amy & Justin Northrop

Messages from HRPO

Highland Road Park Observatory

URANIAN OPPOSITION

Thursday 4 November from 8:45pm to 10:45pm
No admission fee. For all ages.

Uranus is exactly 180 degrees from the Sun, rising as the Sun is setting. We are now the closest we'll be to Uranus this year! Weather permitting viewing of Uranus will take place. Mars, Jupiter, Saturn and Neptune will also be seen.

5th ANNUAL NATURAL SKY CONFERENCE

Friday 5 November from 6pm to 9pm
No admission fee. For ages fourteen and older.

Quite possibly the most important three hours a stakeholder will spend at HRPO this year will be this networking conference allowing HRPO parents, BRAS members and LSU physics professors and students talk to those organizations in the area who have the greatest ability to curb light pollution.

SCIENCE ACADEMY

Saturdays from 10am to 12pm
For ages eight to twelve. $5/$6 per child.

6 November = "Artemis I" Are you ready for the first test-flight of the craft which will return us to the Moon? Yes? Then you might be able to become a Cadet!
13 November = "Historic Experiments I" Archimedes…Galileo…Torricelli. These men unlocked the first pieces of the grand puzzle known as the physical world. Cadets will find out how the pieces fit!
27 November = "Historic Experiments II" Von Guericke…Newton…Watt. The amazing and precious truths of the Universe become clear to Cadets!

EVENING SKY VIEWING

No admission fee. For all ages.
Saturdays (6, 13, 20 November) from 7:30pm to 10pm
Friday 19 November from 8:30pm to 10pm

HRPO houses a 50-cm reflector, a 40-cm reflector and several smaller telescopes to bring the majesty of the night sky to the public. Trained operators, sharing duties via a rotating roster, work throughout the year in shifts. Each operator has a pre-planned list of objects to highlight. However, requests will be taken if there is time and if all present have viewed the previous target.

THE EDGE OF NIGHT

(Fall Session)
Friday 12 November from 4:45pm to 6:45pm
No admission fee. For all ages. Binoculars recommended.

It's not light, it's not dark. It's that special time called twilight, and HRPO wants to introduce you to it! Are all sections of the sky the same shade of blue? Which stars are seen first? Are Mercury and Venus or the Moon out? Is that moving object a plane, a satellite or space debris? There is no other time like twilight. Bring it into your life!

SOLAR VIEWING

Saturday 13 November from 12pm to 2pm.
For all ages. No admission fee. 20OGS Tour at 1pm.
(Solar Viewers, $2 each. Add-on Activity: $2.50.)

The hobby of astronomy immediately brings to mind thoughts of darkened backyards and dimly-lit nighttime activities at HRPO. But patrons also have the option of visiting during daylight hours to see our parent star.
Weather permitting, once monthly HRPO personnel offers three views of the Sun…
12pm to 12:30pm - *indirect projection onto white viewing surface //* [Learning Technologies Sunspotter]
12:15pm to 1:15pm - *safely-filtered optical light sent through standard telescope //* [Orion 10" Skyquest Dobsonian Reflector]
12:30pm to 2:00pm - *hydrogen-alpha light //* [Coronado Solar Max II 90mm]

PARTIAL LUNAR ECLIPSE

Thursday 18 November from 11pm to 5am

No admission fee. For all ages.

Overnight excitement at HRPO as we open to witness one of nature's most spectacular events! While in the constellation Taurus, the Moon will enter the Earth's shadow, turning darker and darker—and then??? The actual color can range from dark brown to red to bright orange to yellow, depending on the current state of the Earth's atmosphere. Don't miss it. *This event does not begin Thursday night; it begins early Friday morning after midnight.*

FRIDAY NIGHT LECTURE SERIES

All start at 7:30pm. All are for ages fourteen and older.

19 November: "Buying Astronomy Stuff" Telescopes, binoculars, planetarium programs, sky maps…mosquito spray. If you want to be a skygazer of action, you need the right tools!

STEM EXPANSION

Saturday 20 November from 3:30pm to 7:30pm. For ages twelve to sixteen. $15/$18 per kid.

This program offers advanced topics, topic extensions and all-new games and activities to an older crowd. Certificates will be earned, and a section of archived experiments, some not seen in over fifteen years (and some *never* performed on site) take place

.

FALL SPACE EXPLORATION CAMP

Monday 22 November and Tuesday 23 November (8am to 5pm daily)

**for Explorers ages 9 to 13*

**$55 per in-parish Explorer / *$66 per out-of-parish Explorer*

Explorers will build and fly a single-stage chemical rocket, while learning about the upcoming missions to the Moon and Mars, and the latest news about the brightening comet! All materials are supplied; Explorers will need a sack lunch and drink that does not require refrigeration. Explorers will also need to bring a hat and sunscreen. Parents may register in person at the HRPO or online at Webtrac (the activity number is 531180).

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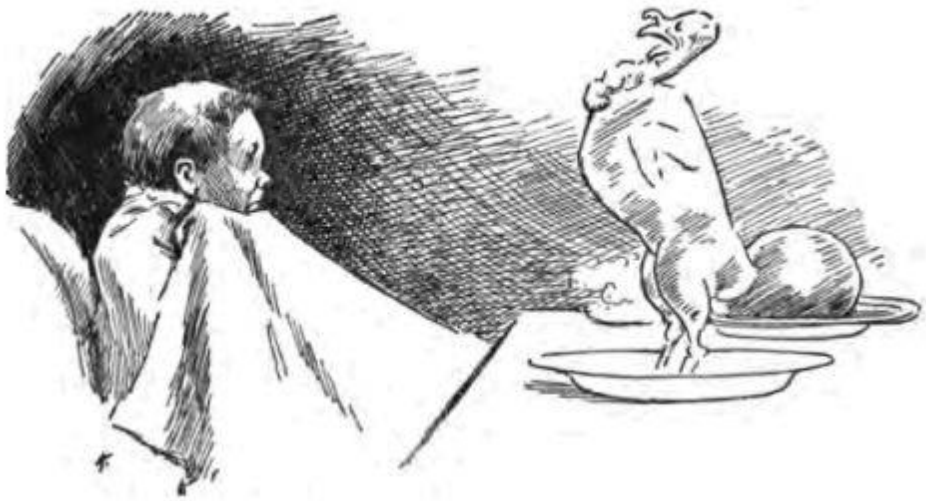
A THANKSGIVING DREAM

By Joseph C. Lincoln, 1902

I'm pretty nearly certain that't was 'bout two weeks ago,—
It might be more, or, p'raps 't was less,—but, anyhow, I know
'T was on the night I ate the four big saucers of ice cream
That I dreamed jest the horriblest, most awful, *worstest* dream.
I dreamed that 'twas Thanksgiving and I saw our table laid
With every kind of goody that, I guess, was ever made;
With turkey, and with puddin', and with everything,—but, gee!
'T was dreadful, 'cause they was alive, and set and looked at me.

And then a great big gobbler, that was on a platter there,
He stood up on his drumsticks, and he says, "You boy, take care!
For if, Thanksgivin' Day, you taste my dark meat or my white,
I'll creep up to your bedroom in the middle of the night;
I'll throw off all the blankets, and I'll pull away the sheet,
I'll prance and dance upon you with my prickly, tickly feet;
I'll kick you, and I'll pick you, and I'll screech, 'Remember me!'
Beware, my boy! Take care, my boy!" that gobbler says, says he.



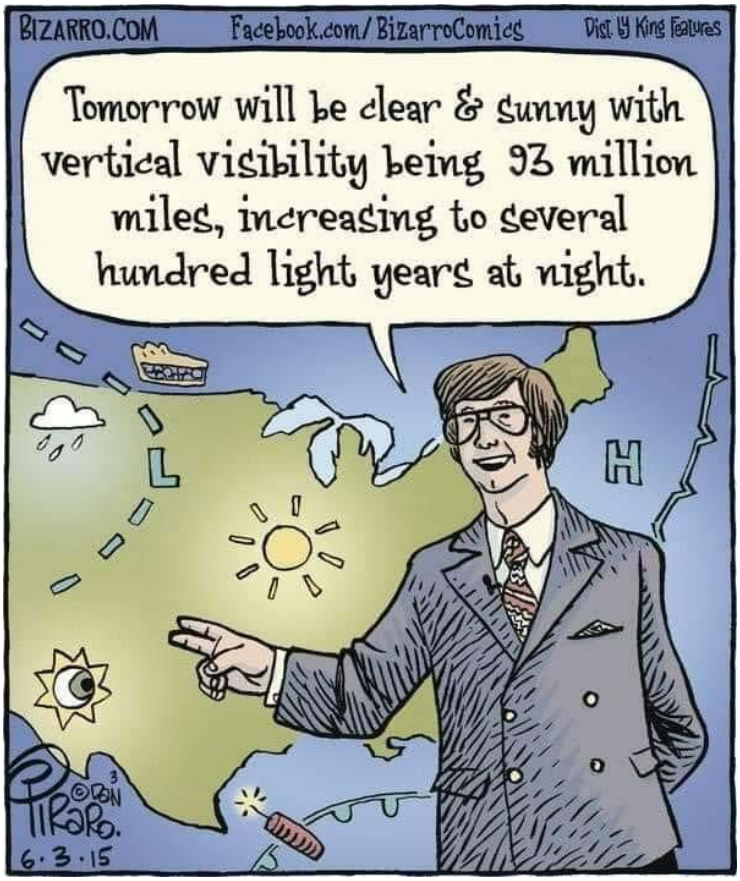
And then a fat plum puddin' kind er grunted-like and said:
"I'm round and hot and steamin', and I'm heavier than lead,
And if you dare to eat me, boy, upon Thanksgivin' Day,
I'll come at night and tease you in a frightful sort of way.
I'll thump you, and I'll bump you, and I'll jump up high and fall
Down on your little stomach like a sizzlin' cannon-ball
I'll hound you, and I'll pound you, and I'll screech 'Remember me!'

Beware, my boy! Take care, my boy!" that puddin says, says he.

And then, soon as the puddin' stopped, a crusty ol' mince pie
Jumped from its plate and glared at me and winked its little eye;
"You boy," it says, "Thanksgivin' Day, don't dare ter touch a slice
Of me, for if you do, I'll come and cramp you like a vise.
I'll root you, and I'll boot you, and I'll twist you till you squeal,
I'll stand on edge and roll around your stomach like a wheel;
I'll hunch you, and I'll punch you, and I'll screech, 'Remember me!'"

I don't know what came after that, 'cause I woke up, you see.

You wouldn't b'lieve that talk like that one ever *could* forget,
But, say! ter-day's Thanksgivin,' and I've et, and et, and et!
And when I'd stuffed jest all I could, I jumped and gave a scream,
'Cause all at once, when 't was too late, I 'membered 'bout that dream.
And now it's almost bedtime, and I ought ter say my prayers
And tell the folks "good-night" and go a-pokin' off up-stairs;
But, oh, my sakes! I dasn't, 'cause I know them things'll be
All hidin' somewheres 'round my bed and layin there fer me.



OBSERVING NOTES NOVEMBER

Andromeda – The Chained Maiden

Position: RA 00 46, Dec.+37°

Note: For six years I have been writing these Observing Notes, featuring the 60 constellations we can see before midnight from Baton Rouge, that contain objects above magnitude 10. Beginning with the February 2019 newsletter, I began to update the constellations with new and expanded material, but the Sky Happenings calendar and associated information are new each month.

Named Stars

Alpheratz (Alpha And), Alpoherat, "Sirrah" from the Arabic "Al Surrat al Faras", "The Horse's Naval", or "Al Räs al Mar'ah al Musqlsalah", The Head of the Woman In Chains", mag. 2.07, 00 08 23.17 +29 05 27.0, is a spectroscopic binary star with a period of 96.697 days, it was formerly designated as **Delta Pegasi**. It has an optical companion, 11th magnitude with a separation of 64.9" to 81.5" at a PA of 280°, but it is not a true companion. Its spectrum has an unusual abundance of Mercury and Manganese. Also known as **HD 358**, **HIP 677**, and **21 Andromadae**.

Mirach (Beta And), Merach, Mirath, Mirac, from the Arabic "Al Janbal Musalsalah", "The Side of the Chained Woman", or "Mi'zar", "a girdle or waistcloth", and sometimes called "Angulum" or "Ventrate" – "on Andromeda's left hip", mag. 2.07, 01 09 43.80 +35 37 15.0, is a red giant star. There is a 14th magnitude dwarf star companion at PA 202° and at a separation of 28". There are two more optical companions, both at 12th magnitude, with separations of 85" and 90". **NGC 404** (**Mirach's Ghost**) is 6.4' to the northwest. Also known as **HD 6860**, **HIP 5447**, and **43 Andromedae**.

Almach (Gamma And), Almak, from the Arabic "Al Anäk al 'Ard", "The Caracacl" (desert Lynx), or "al rijl al musalsalah", "the chained foot" (of the woman), or from the Chinese "Tien Tu Tseang", "Heaven's Great General", mag. 2.10, 02 03 53.92 +42 19 47.5, is a double star. The primary is a golden yellow giant star, with the secondary "B" at magnitude 5.5, being a greenish-blue color at a separation of 10" at a PA of 63°, is also a binary star and a spectroscopic binary (D star, with a period of 2.67 days) at magnitude 5.5 and the "C" star is magnitude 6.3. The AB separation is 800 au, with the BC separation averaging 30 au. Also known as **HD 12533**, **HIP 9640**, and **57 Andromedae**.

Sadiradra (Delta And), mag. 3.27, 00 39 19.60 +30 51 40.4, is a binary star. The primary, a spectroscopic binary, has a companion at a separation of 1.24". The secondary star B is a red dwarf at 12th magnitude and a wide separation of 28.7". There is a line-of-sight companion, C ,16th magnitude, at a separation of 32". Also known as **HD 3627**, **HIP 3092**, **WDS 00393+3052A**, and **31 Andromedae**.

Keffal al Salsulat (Iota And), "The Tail", also called "Manus Catenata", mag. 4.28, 23 38 08.18 +43 18 05.1, is a blue-white main sequence star and is part of the asterism "**Fredric's Glory**". Also known as **HD 222173**, **HIP 116631**, and **17 Andromedae**.

Adhil (Xi And), from the Arabic "'adh-Dhuyl", "the train of a garment", mag. 4.87, 01 22 20.39 +45 31 43.5, is a binary star. The primary is an orange giant star. Also known as **HD 8207**, **HIP 6411**, and **46 Andromedae**.

Titawin (Upsilon And), named for the old town of Tetouan in northern Morocco, mag. 4.10, 01 22 20.39 +45 31 43.5, is a main sequence dwarf binary star with four planets in orbit. The secondary star is at magnitude 13.9 with a separation of 55". The b planet is a dwarf star with a separation of 750

au and a period of 4.6 days. The c planet has a period of 241 days, the d planet has a period of 1281 days, and the e planet has a period of 3849 days. This is the first multiple planetary system to be discovered orbiting a main sequence star, and the first multiple planetary system detected in a binary system. Located 5° west of **Gamma Andromedae**. Also known as **HD 9826**, **HIP 7513**, and **50 Andromedae**.

Keun Nan Mun (Phi And), from the Chinese "The Camp's South Gate", also called Jünnánmén, mag. 4.26, 01 09 30.12 +47 14 30.6, is an emission line star. Also known as **HD 6811**, **HIP 5434**, and **42 Andromedae**.

Nembus (51 And), mag. 3.59, 01 37 59.50 +48 37 42.6, is a multiple star. Also known as **HD 9927**, and **HIP 7607**.

Veritate (14 And), from the Latin for "where there is truth", mag. 5.22, 23 31 17.2 +39 14 11.0, is a suspected variable star with one planet in orbit. Also known as **HD 221345**, **HIP 116076**, and **HR 8930**.

Buna (HD 16175), mag. 7.28, 02 37 01.9 +42 03 45.5, has one planet in orbit. Also known as **HIP 12191**.

Groombridge 34 (GRB 34), mag. 8.01, 00 18 22.9 +44 01 22, is a spectroscopic binary star. Both are main sequence red dwarfs and flare stars. The secondary is at magnitude 8.01, has a separation of 39" and an orbital period of 2600 years at PA 62°. There is a third star, 11th magnitude, at a separation of 20", but it is not a physical member of the system. Located 0.25° north of **26 Andromedae**. Also known as **GX Andromedae** (**GRB 34A**), **GQ Andromedae** (**GRB 34B**), **HD 1326**, **HIP 1415**, **GCIP 49**, **GJ 15A/B**, **MCC 85**, **WDS 787**, **ADS 246**, and **BD+43° 44**.

Sterrennacht (HAT-P-6), mag. 10.54, 23 39 05.81 +42 27 57.5, has one transiting planet.

Ross 248 (HH Andromedae), mag. 12.29, 23 41 54.99 +44 10 40.8, is a flare star and the 8th closest star system to us.

Deep Sky:

M 31 (NGC 224), "The Andromeda Galaxy", mag. 3.4, 00 42 42 +41 16, 3.2°x1.0° in size, is one of the most distant objects visible to the naked eye (2.2 million light years from **Earth**). In absolute terms, **M31** is twice the size of the **Milky Way Galaxy**. In about 5 billion years, the **Andromeda** and **Milky Way** galaxies will collide and eventually merge to become the "**Milkymeda Galaxy**". The nucleus of **M31** is spheroidal, having dimensions of about 2.5'x1.5' in size, with the major axis aligned with the spiral's disk. At least 430 globular clusters have been found surrounding **M31**, and over **30 RR Lyrae** type variable stars have been discovered in its halo. In 1923, Dr. Edwin Hubble studied several Cepheid variable stars that were identified in the "**Andromeda Nebulae**" (so called because all galaxies were thought to be "nebulae" at that time). Dr. Hubble definitely established the great **Andromeda** spiral as an extra-galactic object, and it was announced at the **American Astronomical Society** meeting in Washington, DC, in December of 1924. The nucleus of the **Andromeda Galaxy** seems to be something of the nature of a super-globular star cluster, containing possibly over 10 million stars. In such a mass, the separation of the stars would average only a few hundred AU, and the density would be about 50 to 60 stars to the cubic lightyear. **NGC 206** is located near the south tip of the galaxy, and close to the western rim. **M31** has four small satellite companions – **M32** (**NGC 221**); **M110** (**NGC 205**); **NGC 185**; and **NGC 147**. **M32** is 24' to the south of **M31's** central mass, **NGC 205** is 35' northwest of **M31's** nucleus, **NGC 185** and **NGC 147** are about 7° to the north and located in the **Cassiopeia** constellation. **M31** is just over 1° west and slightly north of the star **Nu Andromedae** (magnitude 4.5). Also known as "**The Great Andromeda Galaxy**", "**Queen of the Nebulae**", "**Little Cloud**", "**The Great Nebulae**", **UGC 454**, **C 535-017**, **C 0040.0+4100**, **MCG+7-02-016**, **PGC 2557**, and **IRAS 00400+4059**.

M32 (NGC 221), mag. 8.1, 00 42 42 +40 52, 7.6'x5.8' in size, is a dwarf elliptical galaxy of about 400 million stars with a supermassive black hole in its center, and a satellite companion to **M31**. It is very bright, large, and round. Located about 0.5° south of the core of **M31**. Also known as **UGC 452**,

ARK 012, **Arp 168**, **MCG+7-02-015**, **KTG 01B**; **C 535-016**, **C 0039.9+4035**, and **IRAS 00399+4035**.

M110 (NGC 205), mag. 8.1, 00 40 24 +41 41, 19.5'x11.0' in size, is a dwarf elliptical galaxy, the largest satellite galaxy and companion of **M31**, and has a molecular cloud. It is very bright, large, and somewhat elongated. Discovered in 1783 by Caroline Herschel, it was added to the **Messier** catalog in 1967. Located about 40' northwest of the center of **M31**. Also known as "**Edward Young Star**", **UGC 426**, **PGC 2429**, **MCG+7-02-014**, **Holm 17c**, **KTG 01A**, **C 535-014**, **C 0037.6+4125**, **H5-18**, and **IRAS 00376+4124**.

NGC 7686, mag. 5.6, 23 30 06 +49 08, 15'x15' in size, is an open cluster of 20 stars; not well detached from the surrounding star field; small range in brightness; magnitude of brightest star is 6.2; possibly an asterism. Also known as **OCL 251**, **H8-69**, **Cr 456**, **Lund 1037**, and **C 2327+488**.

NGC 752, mag. 5.7, 01 57 42 +37 40, 50'x50' in size, is an open cluster of 60 stars; detached, no concentration of stars; small range in brightness; extremely large cluster; magnitude of brightest star is 9.0. The stars in this cluster are metal poor – the estimated age of this cluster is about 1.5 billion years old. Located about 5° south and 2° west of **Gamma Andromedae**. Also known as **OCL 363**, **H7-32**, **C 28**, **Cr 23**, **Lund 64**, **Mel 12**, **Raab 8**, and **C 0154+374**.

NGC 7662, "The Blue Snowball Nebulae", mag. 8.3, 23 25 54 +43 32, 0.62'x0.62' in size, is a planetary nebula that is very bright, pretty small, and round. Central star is at magnitude 13.2. It shows a bluish disk with a wooly border and a suspicion of a dark center. It is located about 2.5° west-southwest of **Iota Andromedae**. Also known as "**Copeland's Blue Snowball**", **H4-18**, **C 22**, **PK 106-17.1**, **PNG 106.5-17.6**, **ARO 20**, **VV 285**, **Leda 165926**, **GC 4964**, **h 2241**, **B3 2323+422**, and **IRAS 23234+4215**.

NGC 272, mag. 8.5, 00 51 24 +35 49, is an open cluster of 8 stars, an L-shaped asterism. There is a 7' diameter heart-shaped asterism 15' to the northwest. Also known as **OCL 312**, and **C 0048+355**.

NGC 956, mag. 8.9, 02 32 30 +44 36, 8'x8' in size, is an open cluster of 30 stars. Also known as **OCL 377**, **Cr 27**, **Lund 80**, and **C 0229+444**.

vdB 158, mag. 9.0, 23 38 +48 30. Also known as **BD+47 4220**, and **HD 22214**.

NGC 891, "Silver Sliver Galaxy", mag. 9.9, 02 22 36 +42 21, 13.1'x2.5' in size, is a bright, very large, and very elongated galaxy with a broad dust lane. Discovered by Caroline Herschel in 1783, using a small 30x reflector telescope. Edge on, brightest at edges rather than along the central part. Located 4° east of **Gamma Andromedae**. Also known as "**Outer Limits Galaxy**", **UGC 1831**, **C 23**, **PGC 09031**, **MCG+7-05-046**, **C 0538-052**, **C 0219.4+4207**, and **IRAS 02193+4207**.

Deep Sky Objects of note beyond magnitude 10:

NGC 404, "Mirach's Ghost", mag. 10.3, 01 09 34 +35 43, 4.3'x3.5' in size, is a galaxy that is pretty bright, quite large, round; very small extremely bright nucleus; semi-circular dust lane. Located just 7' northwest of **Beta Andromedae** – it is hard to see due to the glare from the star. Also known as **UGC 718**, **H2-224**, **PGC 04126**, **LGG 011-009**, **MCG+6-03-018**, **C 0520-020**, **C 0106.7+3527**, and **IRAS 01066+3527**.

NGC 206, mag. 10.8, 00 40 34 +40 44 22, 3.6'x2.0' in size, is a star cloud (**OB 78**) in the southwest end of **M31**.

Andromeda's Parachute Quasar, mag. 15.4 to 17.7, 01 47 09 +46 30 37, is a gravity lensed quasar.

Abell 21, "Medusa Nebulae", mag. 16.2, 00 20 30 +28 38, 48' in size.

Donatiello 1, "Mirach's Goblin", 01 11 40.37 +34 36 03.2, 0.96' in size, is a dwarf spheroidal galaxy, and a possible satellite to **NGC 104** – "**Mirach's Ghost**".

GRB 101225A, "A Christmas Burst", 00 00 47.51 +44 36 01.1, was a 28-minute-long gamma ray burst.

Titan Nebula (PaStDr 9), mag. 20 to 23, 1.5° wide, is a new planetary nebula candidate that surrounds a white dwarf star (at 90,000° Kelvin). It was discovered by Patchick, Strottner, and Dreschler, and was officially announced in the 3rd week of October, 2021. It has also been given the designation **PNG 140.4-21.2**.

Objects found in Andromeda: 167 NGC; 39 IC; 349 UGC; 1 UGCA; 174 MCG; 92 CGCG;

11 Arp; 2 AGC; 8 Radio galaxies; 4 Quasars; 40 Herschel; 2 Qatar; 3 HCG; 1 LBN; 1 DG; 17 Abell; 18 Andromeda satellite galaxies; 2 Baade; 1 vdB; 1 ClvdB; 1 Kar; 1 K; 1 TPK; 1 Vy2; 1 Pat; 1 Kron; 1 M1; 1 Cou; 2 Zannin; 1 Naillon; 1 Lederman; 2 Monti; 1 AC; 1 G1; 1 h; 1 AV; 1 Mayall; 1 Donatiello; 1 Kelt; 2 Al; 1 GRB; 1 OB Association; 3 Caldwell; 3 Cr; 1 Mel; 1 Mrk; 15 VV; 1 S; 7 Zw; 73 PGC; 4 PNG; 3 Lund; 4 LEDA; 4 ARO; 3 ARK; 1 LGG; 5 OCL; 1 MKN; 4 PK; 3 HOLM; 7 NPM1G; 12 IRAS; 1 WBC; 10 WBL; 1 Raab; 2 USGC; 1 KUG; 1 KPG; 5 KTG; and 1 PaStDr; for a total of 1135 objects.

Other Stars:

Omicron Andromedae, mag. 3.62, 23 01 55.25 +42 19 33.5, is a quadruple star system. The primary, a close binary, rotates at 215 miles per second at the equator. Also known as **HD 217675**, **HIP 113726**, and **1 Andromedae**.

Kappa Andromedae, mag. 4.15, 23 40 24.44 +44 20 02.3, is a triple star with one planet in orbit. The secondary star, B, is at magnitude 11.0 with a separation of 46.8" from the primary. Also known as **HD 222439**, **HIP 116805**, and **19 Andromedae**.

V428 Andromedae, mag. 5.14, 00 36 46.47 +44 29 18.6, has a possible planetary system. Also known as **HD 3346**, and **HIP 2900**.

6 Persei, mag. 5.31, 02 13 36.02 +51 03 58.4, is a spectroscopic binary star that was originally part of the constellation **Perseus**. Also known as **HD 13530**, and **HIP 10366**.

6 Andromedae, mag. 5.91, 23 10 27.36 +43 32 41.1, is an astrometric binary star. Also known as **HD 218804**, and **HIP 114430**.

HD 5608, mag. 5.99, 00 58 14.19 +33 57 03.8, has one transiting planet. Also known as **HIP 4552**.

HD 8673, mag. 6.34, 01 26 08.62 +34 34 47.7, has one planet in orbit. Also known as **HIP 6702**.

GY Andromedae, mag. 6.38, 01 38 31.84 +45 23 58.9, has Promethium lines in its spectrum. Also known as **HD 9996**, and **HIP 7651**.

HD 222155, mag. 7.1, 23 38 00 +48 59 47, has one planet in orbit. Also known as **HIP 116616**.

HD 1605, mag. 7.52, 00 20 32.0 +30 58 29, has two planets in orbit. Also known as **HIP 1640**.

HD 13931, mag. 7.52, o2 16 47.38 +43 46 22.8, has one planet in orbit. Also known as **HIP 10626**.

HD 5583, mag. 7.6, 00 57 57.0 +34 59 08.0, has one planet in orbit.

HD 15082, mag. 8.3, 02 26 51.06 +37 33 01.7, has one transiting planet (**WASP-33b**). Also known as **HIP 11397**.

Other Stars of interest beyond magnitude 10:

HAT-P-16, mag. 10.08, 00 3817.56 +42 27 47.2, has one transiting planet.

HAT-P-32, mag. 11.29, 02 01 10 +46 41 16, has one transiting planet.

WASP-1, mag. 11.79, 00 20 40.08 +31 59 27.8, has one transiting planet.

Kepler 63, mag. 12.02, 01 17 07.6 +49 32 54, has one transiting planet.

HAT-P-19, mag. 12.9, 00 38 04 +34 42 42, has one transiting planet.

HAT-P-28, mag. 13.03, 00 52 00 +34 43 42, has one transiting planet.

HAT-P-53, mag. 17.73, 01 27 29.0 +38 58 05, has one transiting planet.

S Andromedae, 00 42 43.11 +41 16 04.2, was a Type 1a supernova (magnitude 16.0 to 5.6). Also known as **SN 1885A**, and **BD+40°147a**

Asterisms:

"Fredrick's Glory", 23 41 16 +45 44 29, 300"x300" in size, is a Y-shaped asterism. The name is derived from a former, now non-existent, constellation called "**Frederic Honores**". It consists of the stars **Iota** (a blue-white star), **Kappa** (a white star), **Lambda** (a yellow giant star), **Omicron** (a blue-white giant star), and **Psi Andromedae** (a blue-white star).

"The Golf Putter", 01 51 19 +37 23 49, 95'x25' in size, is a 1° long chain of stars with several stars at its end that forms a golf club shape.

Lederman 1, "Black Widow Spider", 02 27 18 +42 18 30, 14'x9' in size, is comprised of GSC stars. Located just north of the **NGC 911** galaxy group.

Tien Ke, "The Heavenly Stable", is composed of the stars **Theta**, **Rho**, and **Sigma Andromedae**.

Stars found in Andromeda: 24 Greek; 73 numbered; 109 Lettered; 54 V; 49 Σ; 15 OΣ; 2 OΣΣ; 1 ΣI; 15 β; 4 h; 4 Es; 5 Ho; 2 S; 3 AC; 6 A; 1 Hn; 1 Grb; and 1 Mäd; for a total of 368 stars.

Sky Happenings: November 2021

(what follows pertains ONLY to the current month. Material above is good year after year.)

Nov. 1st - Dawn: **Mercury** and **Spica** rise together in the east-southeast, with 4° separation.
Nov. 2nd - Double shadow transit on **Jupiter** starting at 5:02 AM CDT.
Nov. 3rd - Dawn: The **Moon**, **Mercury**, and **Spica** form a triangle low in the east-southeast before the **Sun** rises,
The **Moon** passes 1.2° north of **Mercury** at 2 PM CDT, with a daytime occultation for the northeast **United States** and most of **Canada**.
Nov. 4th - **New Moon** occurs at 4:15 PM CDT (Lunation 1223),
Uranus is at opposition at 7 PM CDT.
Nov. 5th - The **Southern Taurid Meteor Shower** peaks at 7 AM CDT,
The **Moon** is at perigee (222,975 miles or 358,843 km from **Earth**) at 5:18 PM CDT.
Nov. 7th - **Daylight Savings Time** ends at 2 AM CDT,
Dusk: In the west-southwest, the young **Moon** and **Venus** are 3.5° apart to the left of the **Teapot** asterism in **Sagittarius**,
The **Moon** passes 1.1° north of **Venus** at 11 PM CST.
Nov. 9th - Dusk: The waxing crescent **Moon**, **Jupiter**, and **Saturn** are in a line about 25° long above the southern horizon, with **Venus** in the southwest,
Mercury passes 1.1° north of **Mars** at 11 PM CST.
Nov. 10th - The **Moon** passes 4° south of **Saturn** at 8 AM CST.
Nov. 11th - **First Quarter Moon** occurs at 6:46 AM CST,
The **Moon** passes 4° south of **Jupiter** at 11 AM CST,
Dusk: Above the southern horizon, the first-quarter **Moon** is 5° to the lower left of **Jupiter**.
Nov. 12th - The **Northern Taurids Meteor Shower** peaks at 5 AM CST.
Nov. 17th - Morning: Viewing of the typically weak **Leonid Meteor Shower** will be severely hampered by the nearly full **Moon,**
Leonid Meteor Shower peaks at 11 AM CST,
The **Moon** passes 1.5° south of **Uranus** at 8 PM CST.
Nov. 19th - **Partial Lunar Eclipse** starts at 1:18 AM CST,
Full Moon occurs at 4:47 AM CST,
Maximum (97%) of the lunar eclipse occurs at 3:03 AM CST,
Partial Lunar Eclipse ends at 4:47 AM CST,
Dusk: The **Moon**, just past full, rises in the east, between the **Pleiades** and the **Hyades**.
Nov. 20th - The **Moon** is at apogee (252,450 miles or 406,279 km from **Earth**) at 8:13 PM CST.
Nov. 22nd - The **Moon** is 1.8° north of **M35** at 2 AM CST.
Nov. 23rd - Evening: In the east, the **Moon** is in **Gemini**, 3° from **Pollux**,
Double shadow transit on **Jupiter** starts at 5:52 PM CST.
Nov. 24th - Evening: The **Moon**, in **Cancer**, is nearly 3° from the **Beehive Cluster** (**M44**).
Nov. 26th - **Ceres** is at opposition at 10 PM CST.
Nov. 27th - **Last Quarter Moon** occurs at 6:28 AM CST,
Mercury is in superior conjunction at 11 PM CST.
Nov. 28th - Asteroid **Vesta** is in conjunction with the **Sun** at 4 AM CST.

Planets:

Mercury – Mercury will continue to hang low in the southeast sky before sunrise. On November 1st, **Spica** will be 4.2° due south of the planet, shining at magnitude -0.8. A crescent **Moon** will occult the planet

during daylight. Eastern **United States**, from **Florida** to **Wyoming** (in a diagonal line), and western **Canada** will be able to see this. The planet will be lost in bright twilight by the 2nd week of the month as it heads toward its conjunction with the **Sun** on the 28th. The planet will reappear in the evening sky in December.

Venus – Venus will cross into **Sagittarius** on November 1st, and will be visible within ½ hour of sunset, low and bright (magnitude -4.5) in the southern sky. On the 6th, the planet is less than 3° south of the **Lagoon Nebulae** (**M8**). On the 7th, a slender crescent **Moon** will be about 3° west of the planet. On the 14th, **M22** will be 3° north of the planet. On the 19th, the planet is ½ the **Moon's** width from the 2nd magnitude star **Nunki** (**Sigma Sagittarii**). Through a telescope, the planet will reveal a 48% lit disk spanning 26" on the 1st, to a 29% lit crescent 39" wide on the 30th.

Mars – Mars is too close to the **Sun** to observe during most of November. It is in conjunction with **Mercury** on the morning of the 10th, but the pair are very low in the east-southeast, with **Mars** 1° below **Mercury**.

Jupiter – Jupiter shines at magnitude -2.5 in eastern **Capricornus** and will remain about 16° east of **Saturn** all month. On November 1st, the planet is 1.9° northwest of **Deneb Algedi** (**Delta Capricorni**), passing 1.6° due north of the star on the 22nd, and will be 2.2° northeast of the star on the 30th. Best viewing time is in the twilight, when it will be ⅓ of the way to the zenith in the southwest. The planet sets soon after midnight on the 1st, and by 11 PM local time on the 30th. There will be two double shadow transits of **Jupiter** this month. The 1st is on November 2nd, will start with **Ganymede** starting its transit at about 12:41 AM CDT, with **Io** starting transit at about 3:45 AM CDT. **Ganymede** ends transit at about 4:17 AM CDT. **Io's** shadow starts transit at about 5:03 AM CDT, with **Ganymede's** shadow starting transit at about 6:02 AM CDT. **Io** ends transit at about 6:02 AM CDT, with its shadow exiting transit at about 7:20 AM CDT. **Ganymede's** shadow will exit transit at about 9:34 AM CDT. The 2nd double shadow transit of **Jupiter** is on the 23rd. **Callisto** will star transit at about 5:56 AM CST and will exit transit at about 10:31 AM CST. **Ganymede** will start transit at about 4:19 AM CST, with its shadow starting transit at about 6:08 AM CST. **Callisto's** shadow will start transit at about 6:52 AM CST. **Ganymede's** shadow exits transit at about 9:39 AM CST, with **Callisto's** shadow exiting transit at about 11:03 AM CST.

Saturn – Saturn is in the western half of **Capricornus**, moving slowly eastward as the month progresses. The planet is visible as twilight descends and will set soon after 11:30 PM local time on November 1st, and by 9 PM on the 30th. The planet starts the month at magnitude 0.5 and will dim 0.1 magnitude by month's end. The planet's disk spans 17" wide with the ring's major axis stretching 38" wide. The ring system is tilted 19° from our line of sight, showing off its northern face. **Titan**, the planet's brightest moon, is at magnitude 8.7. It will be north of the planet on the 6th and 22nd, and south of the planet on the 14th and 30th. Three fainter (magnitude 10) moons, orbiting closer in, are **Tethys**, **Dione**, and **Rhea**. The moon **Enceladus** is at magnitude 11.7 and is close to the bright rings. The moon **Iapetus** will reach inferior conjunction on the 18th, and it will appear closer to the planet than usual. It will be within 1' of the planet from the 17th to the 19th. **Iapetus** moves west of the planet in the latter half of the month, turning its brighter side toward **Earth**, shining at about 11th magnitude.

Uranus – Uranus reaches opposition on November 4th and remains visible all night. It lies about 18° southwest of the **Pleiades** in a sparse region of **Aries**. Shining at magnitude 5.7, the planet starts the month 0.8° due west of **Omicron Arietis** (magnitude 5.7) - 5° north of the 4th magnitude star **Mu Ceti**. By the 17th, the planet will stand 1.8° northwest of a nearly full **Moon**, and is 1.5° west of **Omicron Arietis**, which is 1.7° due north of the **Moon**. The planet will continue moving westward, ending the month 2° west of **Omicron Arietis**. Best viewing time is about midnight local time. The planet spans 4' and has a greenish-blue hue.

Neptune – Neptune is in **Aquarius**, shining at magnitude 7.7, and will remain visible until after midnight all month. The planet is just over 3° northeast of the 4th magnitude star **Phi Aquarii** on November 1st. The gap between the two will shrink to only 15' during the month as the planet approaches its stationary point, which occurs on December 1st. **Phi Aquarii** is roughly 8° south of the **Circlet** in **Pisces**. The planet has a disk spanning 2' through a telescope.

Moon – The Moon will have the following favorable librations: **Vashakidze Crater** on November 11th; **Mare Humboldtianum** on the 15th; **Andersson Crater** on the 25th; and **Catalan Crater** on the 28th.

Greatest North Declination on the 23rd (+26.3°)

Greatest South Declination on the 9th (-26.2°)
Libration in Longitude: East Limb most exposed on the 13th (+7.2°)
West Limb most exposed on the 28th (-7.5°)
Libration in Latitude: North Limb most exposed on the 12th (+6.8°)
South Limb most exposed on the 27th (-6.8°)

Asteroids / Minor Planets Asteroid **1 Ceres** – **Ceres** positions, according to the ***RASC Observers Handbook***, ***2021 USA Edition***, are as follows: On November 2nd – 04 36.79 +16 22 36, at magnitude 7.6 in **Taurus**; on the 12th – 04 29.20 +16 29 48, at magnitude 7.4 in **Taurus**; and on the 22nd – 04 19.91 +16 38 06, at magnitude 7.1 in **Taurus**. **Ceres** positions, ***by my estimates***, are as follows: On November 1st – about 0.2° east and slightly south of **Aldebaran** (**Alpha Taurii**); on the 5th – about 0.5° due west of **Aldebaran**; on the 10th – about 0.8° north and a little east of **Theta Taurii**; on the 15th – about 1.2° southeast of **Delta Taurii**; on the 20th – about 1° south-southwest of **Delta Taurii**, or just over 1° north and a touch east of **Gamma Taurii**; on the 25th – 1.4° northwest of **Gamma Taurii**; and on the 30th – about 2.5° west-northwest of **Gamma Taurii**.

Asteroid **2 Pallas** – **Pallas's** positions, according to the ***RASC Observers Handbook***, ***2021 USA Edition***, are as follows: On November 2nd – 22 45.16 -10 11 30, at magnitude 9.4 in **Aquarius**; on the 12th – 22 46.45 -11 12 12, at magnitude 9.6 in **Aquarius**; and on the 22nd – 22 49.83 -11 53 24, at magnitude 9.7 in **Aquarius**.

Asteroid **6 Hebe** – **Hebe's** positions, according to the ***RASC Observers Handbook***, ***2021 USA Edition***, are as follows: On November 2nd – 20 11.08 -22 46 18, at magnitude 9.9 in **Capricornus**; and on the 12th – 20 28.67 -22 34 48, at magnitude 9.9 in **Capricornus**.

Asteroid **44 Nysa** – **Nysa's** positions, according to the ***RASC Observers Handbook***, **2021 USA Edition**, are as follows: On November 12th – 05 35.16 +17 41 36, at magnitude 9.7 in **Taurus**; and on the 22nd – 05 29.25 +17 32 00, at magnitude 9.5 in **Taurus**.

Comets **–** Comet **4P/Faye** – **Faye**, a morning comet, according ***to ALPO***, will be at the following positions: On November 10th – 06 53 18 +10 14, at magnitude 10.7 in **Monoceros**; on the 20th – 06 56 06 +08 55, at magnitude 10.9 in **Monoceros**; and on the 30th – 06 54 36 +07 54, at magnitude 11.2 in **Monoceros**.

Comet **6P/d'Arrest** – **d'Arrest**, an evening comet, according to ***ALPO***, will be at following positions: On November 10th – 21 18 24 -31 10, at magnitude 9.9 in **Microscopium**; on the 20th – 21 54 00 -29 46, at magnitude 10.0 in **Piscis Austrinus**; and on the 30th – 22 26 54 -24 47, at magnitude 10.3 in **Piscis Austrinus**.

Comet **8P/Tuttle** – **Tuttle**, a morning comet, according to ***ALPO***, will be at the following positions: On November 10th – 13 03 00 -43 36, at magnitude 10.7 in **Centaurus**; on the 20th – 13 40 00 -46 46, at magnitude 11.4 in **Centaurus**; and on the 30th – 14 15 54 -49 09, at magnitude 12.1 in **Centaurus**.

Comet **19P/Borrelly** – **Borelly's** positions, according to ***ALPO***, will be as follows: On November 10th – 23 06 48 -48 32, at magnitude 11.2 in **Grus**; on the 20th – 23 14 06 -43 55, at magnitude 10.7 in **Grus**; and on the 30th – 23 25 12 -38 40, at magnitude 10.3 in **Grus**.

Comet **67P/Churyumov-Gerasimenko** – **67P**, a morning comet, according to ***ALPO***, will be at the following positions: On November 10th – 07 52 18 +25 36, at magnitude 9.1 in **Gemini**; on the 20th – 08 22 42 +26 45, at magnitude 8.9 in **Cancer**; and on the 30th – 08 45 00 +26 53, at magnitude 8.9 in **Cancer**. **67P's** positions, ***by my estimates***, are as follows: On November 1st – about 1.5° south-southwest of **Iota Geminorum**; on the 5th – about 0.7° southwest of **Upsilon Geminorum**; on the 10th – about 2.1° northwest of **Omega Cancri**; on the 15th – about 1.2° north and a little east of **Psi Cancri**; on the 20th – about 0.5° due east of **Phi² Cancri**; on the 25th - 3° southwest of **Iota Cancri**; and on the 30th – about 2° south and a touch east of **Iota Cancri**, or about 8° north of **M44**.

Comet **C/2019 L3 (ATLAS)** – **L3**, a morning comet, according to ***ALPO***, will be at the following positions: On November 10th – 07 47 06 +39 41, at magnitude 10.5 in **Lynx**; on the 20th – 07 45 12 +38 43, at magnitude 10.4 in **Lynx**; and on the 30th – 07 40 42 +37 38, at magnitude 10.3 in **Lynx**.

Comet **C/2021 A1 (Leonard)** – **Leonard**, a morning comet, according to ***ALPO***, will be at the following positions: On November 10th – 12 04 42 +34 11, at magnitude 11.6 in **Ursa Major**; on the 20th –

12 27 06 +33 10, at magnitude 10.4 in **Canes Venatici**; and on the 30th – 13 13 30 +30 33, at magnitude 8.9 in **Coma Berenices**.

Meteor Showers – There are three **Major** (**Class I**) **Meteor Showers** active in November. The **Orionids**, active from October 3rd through November 12th, peaked on October 21st; the **Leonids**, active from November 3rd through December 2nd, peaks on November 18th with a maximum zenith hourly rate (mzhr) of 10; and the **Geminids**, active from November 13th through December 22nd, peaks on December 14th with a mzhr of 120.

There are 8 **Minor** (**Class II) Meteor Showers** active in November. The **Epsilon Geminids**, active from September 27th through November 8th, peaked on October 18th; the **Leonis Minorids**, active from October 13th through November 3rd, peaked on October 21st; the **Southern Taurids**, active from September 22nd through December 2nd, peaks on November 5th with a mzhr of 5; the **Northern Taurids**, active from October 13th through December 2nd, peaks on November 12th with a mzhr of 5; the **November Orionids**, active from November 13th through December 12th, peaks on November 30th with a mzhr of 3; the **Sigma Hydrids**, active from November 22nd through December 26, peaks on December 7th; the **Monocerotids**, active from November 17th through December 26th, peaks on December 11th; and the **December Leonis Minorids**, active from November 22nd through February 10th, peaks on December 20th.

There is only one **Variable** (**Class III**) **Meteor Shower** active in November. The **Alpha Monocerotids**, active from November 21st through November 23rd, peaks on November 21st with the mzhr being variable.

There are 17 **Weak** (**Class IV**) **Meteor Showers** active in November, all having a mzhr of <2. The **Tau Cancrids**, active from September 23rd through November 12th, peaked on October 22nd; the **Southern Lambda Draconids**, active from October 29th through November 8th, peaks on November 4th; the **Chi Taurids**, active from October 24th through November 13th, peaks on November 4th; the **Kappa Ursae Majorids**, active from October 28th through November 17th, peaks on November 5th; the **Andromedids**, active from October 24th through December 2nd, peaks on November 6th; the **Omicron Eridanids**, active from October 23rd through December 2nd , peaks on November 13th; the **Rho Puppids**, active from November 10th through November 20th, peaks on November 13th; the **November Sigma Ursae Majorids**, active from November 17th through December 2nd, peaks on November 24th; the **Theta Pyxidids**, active from November 27th through December 7th, peaks on December 1st; the **Southern Chi Orionids**, active from November 12th through December 21st, peaks on December 2nd; the **December Kappa Draconids**, active from November 29th through December 9th, peaks on December 3rd; the **Psi Ursae Majorids**, active from November 27th through December 12th, peaks on December 4th; the **December Phi Cassiopeiids**, active from November 28th through December 10th, peaks on December 4th; the **December Rho Virginids**, active from November 27th through December 26th, peaks on December 5th; the **December Alpha Draconids**, active from November 30th through December 15th, peaks on December 8th; the **Eta Hydrids**, active from November 22nd through December 31st, peaks on December 13th; and the **December Sigma Virginids**, active from November 22nd through January 25th, peaks on December 21st.

When to View the Planets:

Evening Sky		**Midnight**		**Morning Sky**	
Venus	**(southwest)**	**Jupiter**	**(southwest)**	**Mercury**	**(east)**
Jupiter	**(south)**	**Uranus**	**(southwest)**	**Mars**	**(east)**
Saturn	**(south)**	**Neptune**	**(west)**	**Uranus**	**(west)**
Uranus	**(east)**				
Neptune	**(southeast)**				

Mythology:

Andromeda – The Chained Maiden

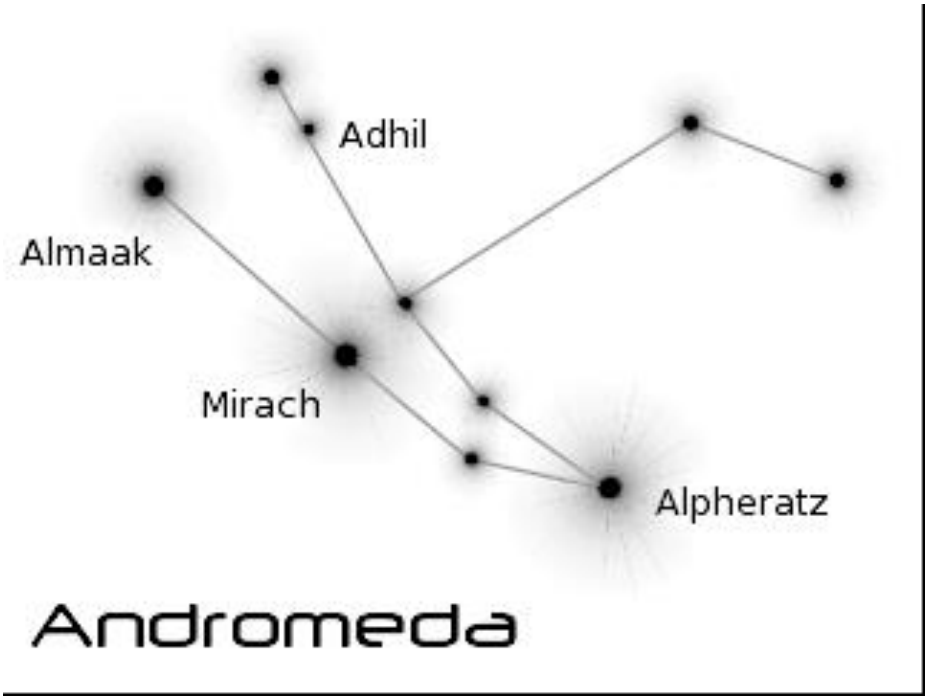
Perhaps the most enduring of Greek myths is the story of Perseus and Andromeda, the original version of George and the Dragon. Its heroine is beautiful Andromeda, the daughter of weak King Cepheus of Æthiopia and the vain Queen Cassiopeia, whose boastfulness knew no bounds.

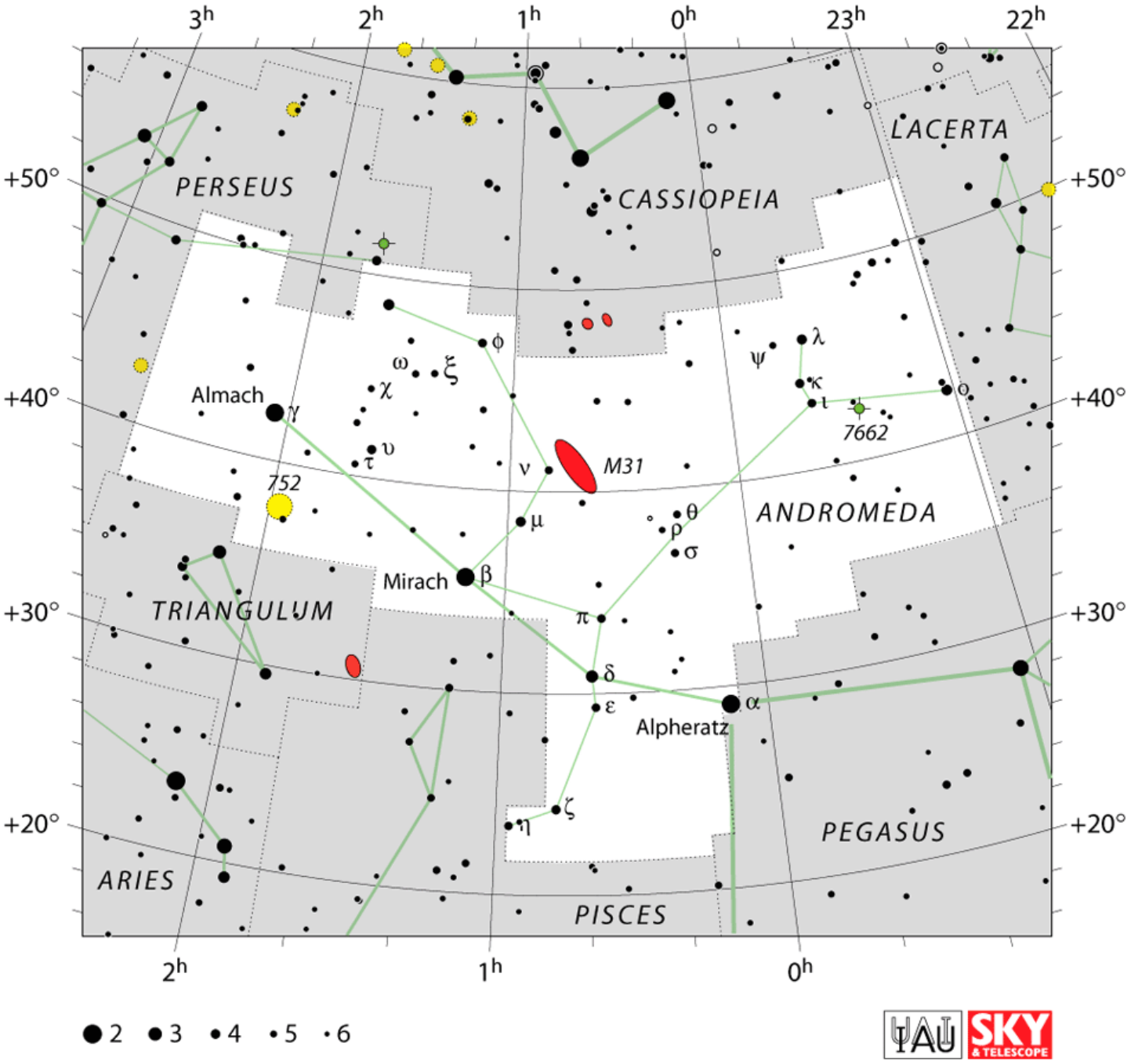
Andromeda's misfortunes began one day when her mother claimed that she was more beautiful even than the Nereids, a particularly alluring group of sea nymphs. The affronted Nereids decided that Cassiopeia's vanity had finally gone too far, and they asked Poseidon, the sea god, to teach her a lesson. In retribution, Poseidon sent a terrible monster (some also say a flood) to ravage the coast of King Cepheus's territory. Dismayed at the destruction, and with his subjects clamoring for action, the beleaguered Cepheus appealed to the Oracle of Ammon for a solution. He was told that he must sacrifice his virgin daughter to appease the monster. Hence the blameless Andromeda came to be chained to a rock to atone for the sins of her mother, who watched from the shore with bitter remorse.

The site of this event is said to have been on the Mediterranean coast at Joppa (Jaffa), the modern Tel Aviv. As Andromeda stood on the wave washed cliff, pale with terror and weeping pitifully at her impending fate, the hero Perseus happened by, fresh from his exploit of beheading Medusa the Gorgon. His heart was captivated by the sight of the frail beauty in distress below.

The Roman poet Ovid tells us in his book "Metamorphoses" that Perseus at first almost mistook her for a marble statue. Only the wind ruffling her hair, and the warm tears on her cheeks showed that she was human. Perseus asked her name and why she was chained there. Shy Andromeda, totally different in character from her vainglorious mother, did not at first reply; even though awaiting a horrible death in the monster's slavering jaws, she would have hidden her face modestly in her hands, had they not been bound to the rock. Perseus persisted in his questioning. Eventually, afraid that her silence might be misinterpreted as guilt, she told Perseus her stary, but broke off with a scream as she saw the monster breasting through the waves toward her. Pausing politely to ask permission of her parents for Andromeda's hand in marriage, Perseus swooped down, killed the monster with his sword, released the swooning Andromeda to the applause of the onlookers, and claimed her for his bride. Andromeda later bore Perseus six children including Perses, ancestor of the Persians, and Gorgophonte, father of Tyndareus, King of Sparta.

It is said that the Greek goddess Athene placed Andromeda's image among the stars, where she lies between Perseus and her mother Cassiopeia. Only the constellation Pisces the Fishes separates her from the Sea Monster Cetus.

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