



Mars after Lowell's GLOBER ca. 1905-1909", from Percival Lowell's maps; National Maritime Museum, Greenwich, London (see Page 6)

Monthly Meeting November 9th at 7:00 PM, via Jitsi
 (Monthly meetings are on 2nd Mondays at Highland Road Park Observatory,
 temporarily during quarantine at meet.jit.si/BRASMeets).

GUEST SPEAKER: Chuck Allen from the Astronomical League will speak about The Cosmic Distance Ladder, which explores the historical advancement of distance determinations in astronomy.



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Observing Notes: Pisces – The Fishes

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

NEW! [BRAS YouTube Channel](#)



President's Message

Welcome to the home stretch for 2020. The nights are starting earlier and earlier as the weather becomes more and more comfortable and all of our old favorites of the fall and winter skies really start finding their places right where they belong. October was a busy month for us, with several big functions at the Observatory, including two oppositions and two more all night celebrations. By comparison, November is looking fairly calm, the big focus there is going to be our third annual **Natural Sky Conference on the 13th**, which I'm encouraging people who care about the state of light pollution in our city and the surrounding area to get involved in. This is primarily a BRAS event, so contact John Nagle if you're able to help out.

December should also be a pretty busy month, with the annual Geminids being in a fantastic time of the lunar month, and then the 2021 preview party. Unfortunately, we've decided to forgo our standard holiday party for the year, but, to make up for it, I'm sure a few of us will end up wearing funny hats or something but, more importantly, Coy has found us a great speaker to help us close out the year. Also, shortly after the meeting we'll have our final Member's night for 2021—marking one full year since we've pushed the program. If we can increase the attendance, we might even be able to start having them more often.

In the meantime, we've decided to try to crank up the old outreach machine, so Ben has been busy checking in with the old standards to see if they might not be willing to host some scopes for an evening event. In speaking with him about it, he reminded me that individual members should feel free to start their own outreaches if they feel up for it, but that if they did contact him, he could get those events listed on the NSN page so that it would enjoy some publicity (and get the club some credit to boot!). Some of us have been dabbling with doing online public star parties in various capacities, too, so if you're looking for ideas on how to get your own online viewing going, be sure to drop us a line.

For the past few months, we've been trying to unload some excess equipment that's been crowding our storage space at HRPO, and John almost has part of the book complete: all of the eyepieces have now been cataloged and the rest of the equipment shouldn't be too far behind. Hopefully, by the December meeting, we should have a good book of reasonably priced items for those looking for last minute holiday gifts. Since we've had no takers on the Blue 16" or the Red 10", we've decided to open them up to other clubs for sale—so, if you were on the fence about either, now is the time to act before it's too late.

At the same time, more donations have been coming in and things are getting crowded again, so we're toying around with ideas on how to get scopes out of the way until they sell: so, taking a page from other groups, we're thinking of starting up a foster-scope program. Details are still getting worked out, but if you can foster a scope, we may be able to help out members in good standing in the near future.

The last things to remind people about is to expect an invoice for membership dues for 2021 in the mail sometime soon. And finally, a reminder that we are still seeking a VP for 2021. We've reduced the workload for the VP, so if you can help out, please consider getting in touch with one of us before the November meeting. And that should be everything. I hope to see everybody at the meeting. We've got a great visitor from the officership of AL, so he's bound to have a great talk for us.

Scott Cadwallader, President 2020



October Member Meeting Minutes

President Scott Cadwallader called meeting to order on Jitsy, on October 12th, 2020

Coy introduces the guest speaker, Tom Field, President of Field Tested Systems and a Contributing Editor of Sky and Telescope Magazine. He will talk about Spectroscopy, and the tools for it.

The talk was live streamed and recorded, available on the BRAS You Tube Channel.

Scott reminded that the 2021 dues are due.

Scott discussed the sale of the 10" and 16" telescopes, and that the focuser needs to be fixed on one of the scopes – it can be done cheaply.

Scott reminded everyone that the Mars Opposition is tomorrow, the 13th of October, with the Uranus opposition later this month.

Ben reported that there is not much outreach right now. The videos are ready for use for the Maker Faire.

Scott asks who wants to be a 2021 Officer? The Vice President's job is open. The VP's duties will be spread out in the future, to reduce the pressure of arranging a program for every meeting.

Meeting was closed at 8:39 PM.



Submitted by Thomas Halligan, Secretary

Upcoming BRAS Meetings:

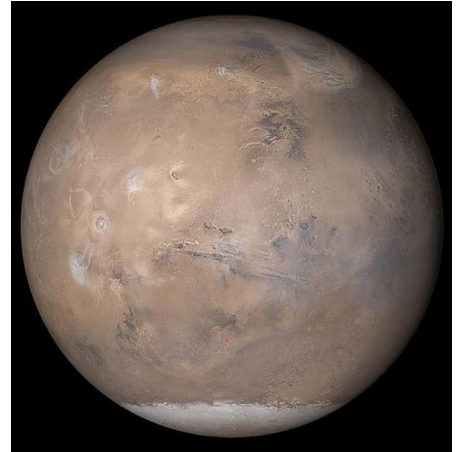
Monthly Member Meeting: **7:00 Monday, November 9th**, via Jitsi remote access (open to the public).

Light Pollution Committee Meeting: **6 pm Wednesday, December 2nd**, via remote access. (Open to the public), followed by

Monthly Business Meeting: **7 pm Wednesday, December 2nd**, (via Jitsi remote access (Members Only)

MOON (Members Only Observing Night), **TBA**.

NASA Photo of Mars 2003



2020 Officers:

President: Scott Cadwallader

Vice-President: Coy Wagoner

Secretary: Thomas Halligan

Treasurer: Trey Anding

BRAS Liaison for BREC:

Chris Kersey

BRAS Liaison for LSU:

Greg Guzik

Committees/Coordinators:

AL Awards

Merrill Hess

Light Pollution:

John Nagle

Newsletter:

Michele Fry

Observing:

John Nagle

Outreach:

Ben Toman

Public Information

Krista Reed

Webmaster:

Frederick Barnett



BRAS Business Meeting Minutes –October 28th, 2020, remotely via Jitsi

(This meeting has been rescheduled to come early enough to be included in each monthly newsletter. See President's Message)

- Scott Cadwallader opened the meeting with having Chris Kersey give an update for HRPO. Chris said:
 - For now, with the restrictions on the Observatory, he had enough volunteers.
 - There will be one more lecture between now and December, and that Merrill Hess will be giving the talk on “How to Buy a Telescope”.
 - The Natural Sky Conference was discussed, and John Nagle said that BRAS is sponsoring the Conference, so a BREC certification of Volunteer is not needed.
 - HRPO's preliminary budget was unchanged except for \$8,000.00 for new hydraulic cylinders for the drop-out. LSU PC in the 16” dome is missing – it was used as spare parts to fix another computer. HRPO is hesitant to use the 16” dome because if the dome jams open, it cannot be shut directly (BREC Maintenance recommended using a tarp to cover it if it jams. There is not an easy solution. The pulley system is in bad shape, and two people would be needed to operate it because the articulating eyepiece would be required by LSU (the 16” is handicap accessible).
 - The Radio dish is not in good shape, and the rotator motor is ruined. He does not want the dish to become an eyesore. Scott said that the dish itself may still be functional and useable.
 - Dr. Guzik is still the LSU Liaison to HRPO.
- Outreach – Ben Tomen said that a makeshift projector and screen works for outreach. He said that no outreach was currently lined up, and that he would inquire if Perkins Rowe would be open to BRAS returning there and what, if any, conditions there may be. He has not talked to Westdale School about the donation of Wally's constellation scope. Ben suggested doing a trial run for outreach.
- Coy said that Chuck Allen, from the Astronomical League will be the November speaker, and that Marty McGuire, a NASA Solar System Ambassador would be the speaker in January.
- Equipment for sale was discussed. Will contact other Astro Clubs about Big Blue. A donation of an older 9.25” SCT, with tripod, needs the corrector plate removed and cleaned, and reassembled. Can either sell, raffle, or keep it.
- Election information must be in the November newsletter, and also at the meeting per the by-laws.
- Trey said Dues are due!
- Meeting was closed at 8:14 PM

Submitted by Thomas Halligan



Here, have some Turkey!



BRAS Outreach Report

Hi Everyone,

Well, at least I can report that we had a few videos submitted for the Mini Maker Faire which was entirely virtual this year. You can see them if you visit our BRAS YouTube channel here: <https://www.youtube.com/channel/UCS3Xkk1t7C9IRnB8GKrt9MQ>.

Also, I gave a virtual presentation to a 5th grade class at the MSA-East Academy on October 20th. I gave a brief overview of our Observatory and a rundown of how we go about imaging different night sky objects. The students were great and had lots of questions.



Scott C's scope set up with the projector and screen ready to go.

display made available. We'll be continuing to evaluate this whole situation to see if this sort of thing can truly be done safely and effectively.

Finally, my test broadcasting a live stream using my Mallincam (an astro video camera) was also successful. (Well, it would have been MORE successful if my telescope battery had been charged!) I was able to show off Mars and Jupiter quickly before my scope gave out. Even though it was cut short, the test proved to me that I could show more than just the Moon in a live stream setting. We'll now be looking at some nearby future dates to do some "Sidewalk Astronomy" that folks can check out from their living rooms! Will let you know when.

In the meantime, if YOU would like to do any virtual observing events, just tell me ahead of time, so I can list it on our outreach

Last weekend, we performed some successful trial runs of some of our equipment we intend to use for (hopefully) upcoming outreach events that will be in front of people. Using a laptop, imaging camera attached to a telescope and a projector with screen, Scott C. and I were able to display good live images of the Moon, Andromeda Galaxy and the Ring Nebula. This capability will make it possible for us to show objects to people in the general public while keeping them properly distanced and keeping our equipment free from being handled. Our next step is to contact a Sidewalk Astronomy partner and see if they are ready to try having such a



The Ring Nebula can be seen in this projected image from Scott's scope.

calendar (even if it's a private event just for friends and family.) It's also possible that you could stream via our Facebook or YouTube page. Contact me, Ben, for details.

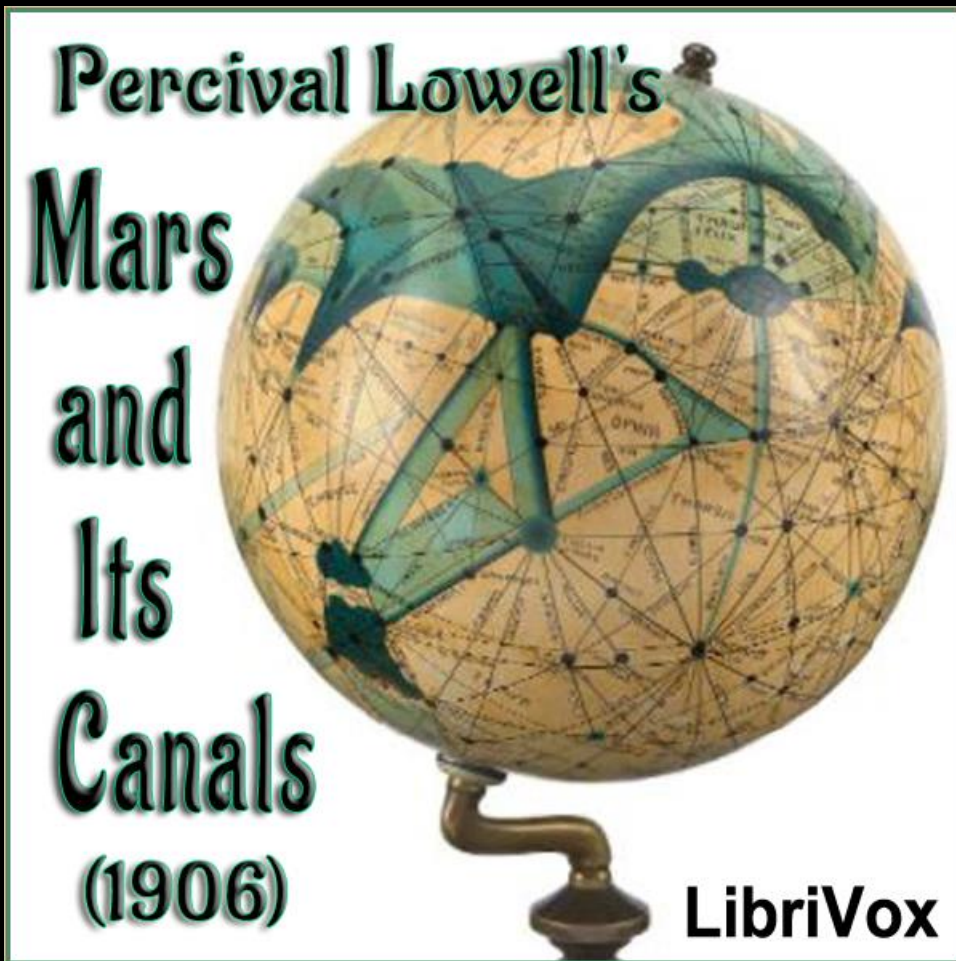
Have a great November, everyone! Hopefully we'll be seeing you all soon, online at the very least!!

Clear Skies,



Ben Toman

No planet beyond Earth has been studied as intensely as Mars. Recorded observations date as far back as ancient Egypt over 4,000 years ago, when they charted the planet's movements in the sky. Today, a science fleet of robotic spacecraft study Mars from all angles. For the latest on Mars, view this interactive site: <https://www.nytimes.com/interactive/2018/05/01/science/mars-nasa-insight-ar-3d-ul.html>



Editor's Note: This is a fascinating read, or listen, just out from one of my favorite volunteer groups – LibriVox Audiobooks!



I give this audiobook 5 stars and urge all you amateur astro-photographers to listen and marvel at the detailed descriptions, drawings and avid discussions these cameraless pioneers made of Mars over 100 years ago. Yes, they got it wrong, but their enthusiasm, curiosity and dedication were 100% real & inspiring.

I am proud to say, also, that I designed this cover.

Mars and Its Canals, a FREE LibriVox Audiobook

Download here: <https://librivox.org/mars-and-its-canals-by-percival-lowell/>

Percival LOWELL (1855 - 1916)

In the days before telescope photography, astronomers had to draw what they thought they saw through the eyepiece throughout the long dark nights. Sometimes they saw more than there really was to see, and a bit over 100 years ago Percival Lowell published books on what he was sure were canals on Mars, signs of intelligent civilization. (In case you too are skeptical, we also have at LibriVox a criticism of Lowell's theories in a book published a year later (in 1907) by Alfred Russel Wallace.) - Summary by ToddHW



BRAS Light Pollution Committee Report

This committee meets at 6:15, same day as the 7:00 BRAS Business Meeting
(NEW SCHEDULE: Meetings will be the Wednesday before the 1st Monday of the month.)
Everyone is welcome to join in..

Meeting called to order by John Nagle.
October 28th.

1. Light Pollution Petition: Master list to be kept at HRPO in locked BRAS cabinet; Sign-up forms to be taken to all BRAS Outreaches; Sign-up sheets and copy of petition to be on display at HRPO.
2. Letters about Light Pollution to be sent to Entergy and Demco.
3. Codified BRAS stand on Light Pollution to be incorporated into the CEA with BREC and LSU.
4. Light Pollution Postcards and Petition with sign-up sheets to go to all Outreach events.
5. Natural Sky Conference to be on Friday, November 13th.
6. Need to contact Public Works Department, Entergy, and Demco to find out which entity controls which street lights.
7. Discussed how and where to install SQM that was donated to HRPO.
8. Discussed contacting Home School groups about getting them to participate in the Globe at Night project.
9. Chris Kersey discussed expanding his survey of local schools for any space/astronomy related activities.

John R. Nagle

Submitted by John R. Nagle, Chairperson

Globe At Night

The target for the Globe At Night program is **Pegasus from November 7th through the 16th.**

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





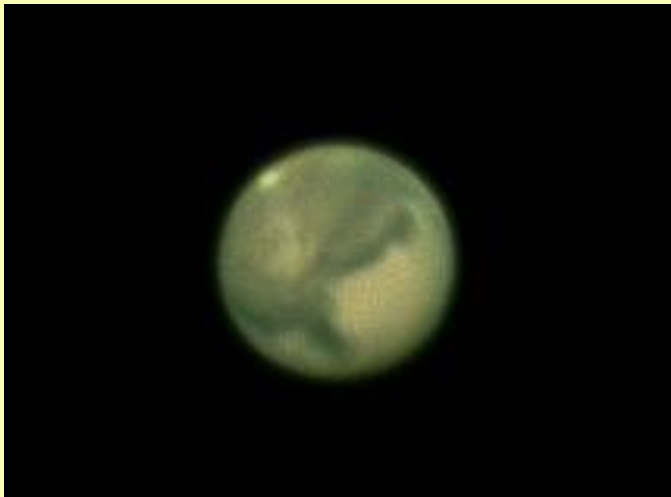
BRAS MEMBER ASTROPHOTOS

A COLLECTION OF 2020 MARS SHOTS

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October 6 2020 at 8 a.m. CDT, Earth and Mars came closer together than they will be again until September 2035. At that precise time, Mars was about 38.57 million miles (62.07 million km) from us. Throughout the month, Mars was shining more brilliantly than Jupiter! Cameras were straining worldwide trying to take the best photos. Some of our BRAS members joined in the fray.

And the beat goes on: “Mars! Mars! Mars! Mars! Mars!”



COY WAGONER: Mars. October 3. Taken from my balcony with my 8” dob and ASI224mc camera.



COY WAGONER: Mars. October 11. Taken from my balcony with my 8” dob and ASI224mc camera.



BRIAN FONTENOT:
Taken in my backyard with 8” SCT scope and Orion Starshoot Mini



SCOTT CADWALLADER: Mars, taken September 16



BEN TOMAN: My best image of Mars so far, using my Mallincam DS287c camera on my Orion 10" Xtg dob. It was 2 minutes of video processed using PIPP, Autostakkert, Registax and GIMP. Right from my own front yard!



CHRIS CARLTON: Mars with Olympus Mons visible near upper edge. Celestron 1100 Edge HD and ZWO 174MC camera, 2.25 Barlow (f6260), best 1250 of 5000 frames at 1/100sec/frame.

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MARS IS NOT JUST A MARBLE. IT IS REAL, MOUNTAINS, VALLEYS, RUTT AND ALL.
NASA's Curiosity rover took this selfie on Oct. 11, 2019 at "Glen Etive",
the 2,553rd Martian day, or sol, of its mission.

Flying “Rocks” and “Dirty Snowballs”:

Asteroid and Comet News

**November 2020
Volume 2, Issue 10.**

JPL Close Approach Data from Sep 26, 2020, to Oct 26, 2020, Distance Nominal < 1 Lunar Distance

Object	Close-Approach (CA) Date	CA Distance Nominal LD	If the Earth was the size of a Basketball (in feet)	H (mag)	Estimated Diameter
(2020 SQ4)	2020/09/26	0.92	21.16	28.9	4.5 m - 10.0 m
(2020 TA)	2020/10/01	0.57	13.11	25.5	21 m - 47 m
(2020 TE5)	2020/10/09	0.15	3.45	29	4.2 m - 9.3 m
(2020 TS1)	2020/10/12	0.66	15.18	29.1	4.0 m - 9.0 m
(2020 TD7)	2020/10/13	0.88	20.24	26.8	12 m - 26 m
(2020 TK7)	2020/10/14	0.2	4.6	29.6	3.2 m - 7.2 m
(2020 UE)	2020/10/15	0.71	16.33	25.6	21 m - 46 m
(2020 TG6)	2020/10/17	0.36	8.28	29.1	4.1 m - 9.2 m
(2020 TE6)	2020/10/18	0.6	13.8	27.5	8.4 m - 19 m
(2020 UX)	2020/10/19	0.49	11.27	31.1	1.6 m - 3.6 m
(2020 TF6)	2020/10/19	0.4	9.2	27.6	8.1 m - 18 m
(2020 UA)	2020/10/21	0.12	2.76	28.4	5.6 m - 12 m
(2020 UY)	2020/10/21	0.91	20.93	29	4.3 m - 9.6 m
(2020 UO3)	2020/10/22	0.91	20.93	28.2	6.1 m - 14 m
(2020 UF3)	2020/10/22	0.11	2.53	28.6	5.1 m - 11 m

As of 2020-10-26 there is

1,078 objects listed on JPL’s Sentry: Earth Impact Monitoring(JPL) (<https://cneos.jpl.nasa.gov/sentry/>)

2,554 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”)

The following objects were removed from NASA JPL's Sentry: Earth Impact Monitoring list from 2020-09-28 to 2020-10-27

Object Designation	Removed (UTC)
2020 PT2	2020-10-27 14:35:41
2020 UA3	2020-10-26 14:57:05
2020 UQ4	2020-10-25 15:22:18
2020 TS4	2020-10-23 16:11:41
2020 RR4	2020-10-22 17:16:29
2018 YO2	2020-10-19 16:09:23
2020 RK	2020-10-16 15:33:50
2020 RD10	2020-10-16 15:32:02
2020 TR2	2020-10-15 15:34:52
2020 SP6	2020-10-15 15:09:42
2020 SP4	2020-10-14 15:08:33
2020 TX2	2020-10-13 14:48:08
2020 SO	2020-10-13 14:42:03
2020 TB1	2020-10-10 14:53:10
2020 TF	2020-10-09 16:08:31
2017 US	2020-10-06 16:10:52
2020 SU4	2020-09-30 13:30:12
2020 SK5	2020-09-28 13:58:29

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>



Members Corner

Here's where we feature articles and photos about BRAS members' astronomy-related accomplishments and adventures outside of BRAS activities (as if there were any spare time for such things!), and/or other astronomical happenings in our neck of the Universe. Send your contributions to Michele at newsletter@brastro.org

ALPO 2020 Virtual Conference

Submitted by John Nagle

On Friday, October 2nd, I attended the ALPO Virtual Conference for 2020 which started at 12:00 noon CDT, and ended at 3:45 PM for the first day. It was moderated by **Tim Robertson**, host of “The Observer’s Notebook” podcast. The conference was opened by **Julius Benton**, the executive director of ALPO. There were four speakers before a break: **Pam Shivak** speaking about the ALPO Youth Program; **Richard Schmude**, of the Remote Planets Section, speaking about “Afternoon Clouds on Mars”; **Carl Hergenrother**, of the Comets Section, speaking about recent comets; and **Roger Venable**, of the Mars Section, speaking about the Martian “Canals” of Lowell and Hubble.

After the break, there were four more speakers: **David Teske**, publisher of the “Lunar Observer” newsletter and of the Lunar Section, speaking on “Lunar Features”; **Alberto Anunziato**, speaking from Argentina on “Short Duration Bright Spots on the Moon”; **Tony Cook**, of the Lunar Transient Phenomena Section, spoke on Lunar Transient Phenomena; and **Ken Poshedly**, of ALPO Publications and the editor of “The Strolling Astronomer” – ALPO’s Journal, gave closing remarks, ending the session for the day at 3:45 PM CDT.



I also attended the Board of Directors Meeting that went from 5-8 PM CDT. It covered the arrangements for the 2021 conference in light of Covid, the ALPO journal (The Strolling Astronomer), membership and finances. I learned that dues will go up in 2022, that membership, for 2020, is 405 members – over 25% have been members for over 25 years, with 1-in-10 being a member for over 10 years. The “Observer’s Notebook” podcast receives an average of 85 downloads a day.

The second day of the conference, Saturday October 3rd, started at 12:00 noon CDT with **Ken Poshedly** giving a welcome. The first

speaker was **Matthew Will**, Secretary/Treasurer of ALPO, followed by **M.D. Dr. Roger Venable**, of the Mars Section. He was followed by **John Rogers**, the BAA Jupiter Section Director, speaking from Barcelona, and then **Frank Melillo**, of the Mercury Section. They all discussed new information about these planets.

After the break, **R. Scott Harris**, an Impact Specialist, talked about “Earth Encounters with Small Asteroids and Comets”. Then **Jerry Hubbell**, Assistant Co-coordinator for Lunar Topography, and V.P. of Engineering for Explore Scientific), spoke about Exo-planet Transit Observation, and how amateurs can do it. The last speaker of the afternoon was **Kim Hay**, Solar Observing in the RASC Observer’s Handbook author, who talked about current solar events. Matthew Will closed the afternoon session at 3:45 PM CDT

The evening session opened at 6 PM CDT. The Walter Haas Observer's Award was given to **Howard Eskidsen**. The Keynote address was given by **Miss Pranvera Hyseni of Kosovo**, 25 years old and founder and director of AOK – the Astronomy Outreach of Kosovo, which has over 200 volunteers. *Miss Kyseni has recently been selected as one of the five most influential women in Kosovo, received the "24Under24" award by the Mars Generation as a young leader in STEM education, holds the AL "Master Outreach Award", named as Slooh's Space Ambassador, and is the main driving force behind the development of the first observatory and planetarium in Kosovo. The observatory and planetarium has had land donated to it, and a road has been built to it. Unfortunately, the Government of Kosovo has backed out of the project after initially approving and agreeing to fund it. Hence, AOK has started a Go-Fund-Me, at "Support the Kosovo Observatory". Kosovo is about the size of Rhode Island and has about 1.8 million citizens.*



Photo Credit: USA TODAY/Anne Saker

Miss Hyseni's talk was about the efforts in changing the norms of Kosovo's society with regard to improving scientific literacy, inspiring the next generation workforce to pursue STEM careers, and inspiring girls and women around the world to make their contributions toward science. She highlighted some of the accomplishments in the last decade, her involvement with the search for minor planets (she has an asteroid named after her – Asteroid 45687), and the plans

for the development of the Observatory for Kosovo.

Finally, door prizes were awarded. An Explore Scientific Eyepiece (82°, 8.8mm, Argon purged) was given to Alberto Anunziato of Argentina, and a Celestron 5 megapixel Web camera was given to R. Scott Harris. The ALPO 2020 Virtual Conference was closed at 8 PM CDT.

Anyone was eligible to attend this conference, free of charge. It was well worth two days of sitting in front of my computer for all I learned.

John R. Nagle

P.S. I reported my 2018 weekend trip with Space Hipsters to visit Michoud in the May 2018 Member's Corner of Night Visions. Almost 2 years later, after many requests, Michoud finally sent out this group photo from that event. Apparently it had gotten lost.

Caption: Hipsters posing by a large fuel tank left over from the shuttle program (I am second from left, light blue shirt.).





Messages from HRPO

Highland Road Park Observatory



REMOTE DISCUSSIONS

All are for ages fourteen and older.

Fridays at 6:30pm.

20 November: "Buying Your First Telescope"



Solar Viewing

Saturday 14 November from 12pm to 2pm.

For all ages. No admission fee.

(Solar Viewers, \$2 each. Add-on Activity: \$2.50.)

Phase 3 Guidelines in effect.

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* // Patrons get a sense of the speed of Earth's rotation as they see the Sun's image slide on or off the projection device. [Learning Technologies Sunspotter]

12:15pm to 1:15pm - *safely-filtered optical light sent through standard telescope* // This option allows patrons to spy sunspots both small and large. [Orion 10" Skyquest Dobsonian Reflector]

12:30pm to 2:00pm - *hydrogen-alpha light* // Flares and prominences are seen easily in this wavelength. [Coronado Solar Max II 90mm]



Edge of Night

Friday 6 November from 4:45pm to 6:45pm

No admission fee; for all ages.

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? How much actual darkness should I expect in a light-polluted city when twilight has passed?* There is no other time like twilight. Bring it into your life!



Natural Sky Conference

Friday 13 November from 6pm to 9pm

No admission fee. For ages fourteen and older.

Although open to the general public the Conference will be aimed at those individuals and organizations in town that have a direct ability to quell the light pollution in the area. HRPO anticipates having the Conference at least through the end of twilight, so participants can see damage currently being caused by the light pollution in the area. The theme of the Conference will be the invitees answering questions (seen beforehand) asking them what they will be actively doing within the next twelve months to lessen the light pollution in the area.

Recent Entries in the BRAS Forum

***Below are selected additions to the BRAS Forum,
which has reached 6900 posts.***

- Anyone [See More Stars](#) During the Power Outages?
- 1938 "[War of the Worlds](#)" Broadcast a Study in Social Behavior
- Skeptical Eyes View [Venus Phosphine](#) News



OBSERVING NOTES NOVEMBER

by John Nagle

Pisces – The Fishes

Position: RA 1, Dec. +15°

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:

Alrescha (Alpha Psc), from the Arabic “Al Rishā”, “The Cord”, variations – Al Rescha, Alrischa, and Alriṣā, it is sometimes called “Kaitain”, and “Okda” from the Arabic “ukd al H’aitain”,

Alpha Piscium A, mag. 4.33, 02 02 02.80 +02 45 49.5, is a close binary star. It is a blue-white main sequence star. Also known as **HD 12446**, **HIP 9487**, **Σ 202**, and **113 Piscium**. **Alpha Piscium B**, mag. 5.23, 02 02 02.80 +02 45 49.0, is also a blue-white main sequence star. There is a separation of 1.8 arc-seconds between the two stars, and an orbital period of 933 years. Also known as **HD 12447**, **Gould 137**, and **113 Piscium**.

Fum al Samakah (Beta Psc), “The Fish’s Mouth”, also called **Fumalsamakah**, and **Samaka**, mag. 4.48, 23 03 52.61 +03 49 12.3, is a blue-white main sequence star. Also known as **HD 217891**, **HIP 113889**, **Gould 14**, and **4 Piscium**.

Simmah (Gamma Psc), mag. 3.70, 23 17 09.49 +03 16 56.1, is a giant yellow star, and is part of the “Circle of Pisces”. Also known as **HD 219615**, **HIP 114971**, **Gould 21**, and **6 Piscium**.

Linteum (Delta Psc), mag. 4.44, 00 48 40.90 +07 35 06.7, is a binary star with the primary being an orange giant star. The companion, at 13th magnitude and a separation of 2’, is thought to be a dwarf star or merely a star in the same line of sight. Also known as **HD 4656**, **HIP 3786**, **Gould 97**, and **63 Piscium**.

Kaht (Epsilon Psc), “Cord”, is a Persian lunar station (in Astrology), and is also called **Haruto-boshi**, mag. 4.27, 01 02 56.66 +07 53 24.3, is an orange giant star that is suspected to be an occultation double star composed of two stars with the same magnitude separated by 0.25 arc seconds. Also known as **HD 6186**, **HIP 4906**, **Gould 103**, and **71 Piscium**.

Revati (Zeta Psc A), name is from Vedic astrology, is a double star, mag. 5.21, 01 13 43.80 +07 34 31.8, is 13° west-northwest of Alpha Piscium. Also known as **HD 7344**, **HIP 5737**, **Σ 100**, and **86 Piscium**. **Zeta Piscium B**, mag. 6.44, 01 13 45.17 +07 34 42.2. Also known as **HD 7345**, **HIP 5743**, **Gould 113**, and **86 Piscium**.

Alperg (Eta Psc), “pouring of water”, also called “Kullat-Nunu”, “Cord of the Fish”, mag. 3.62, 01 31 28.99 +15 20 45.0, is a yellow giant star with a faint companion about 1 arc-second away. Also known as **HD 9720**, **HIP 7079**, and **99 Piscium**.

Torcular (Omicron Psc), “Thread”, from the Latin “Torcularis Septentrionalis”, “Northern Thread”, mag. 4.26, 01 45 23.59 +09 09 27.5, is a yellow giant star. Also known as **HD 10761**, **HIP 8198**, **Gould 127**, and **110 Piscium**.

Anunituni (Tau Psc), mag. 4.51, 01 11 39.59 +30 05 23.0. Also known as **HD 7106**, **HIP 5585**, and **83 Piscium**.

Dzaneb al Samkat (Omega Psc), is also called **Cauda Ascis**, and **Vernalis**, mag. 4.03, 23 59 18.60 +06 51 48.9, is a yellow-white sub-giant star that is suspected of being a close binary variable star. Also known as **HD 224617**, **HIP 118268**, **Gould 56**, and **28 Piscium**.

Van Maanen’s Star, mag. 12.36, 00 49 09.90 +05 23 19.0, is a white dwarf star, and the 31st closest

star system and the 3rd nearest single white dwarf star. It is located about 2° south of **Delta Piscium**. Also known as **HIP 3829**, **Wolf 28**, and **LFT 76**.

Bélénos, mag. 7.11, 01 25 12.52 +28 34 00.1, has one planet in orbit. Also known as **HD 8574**, and **HIP 6643**.

Citadelle, mag. 8.52, 00 19 17 +14 03 17, has one planet in orbit. Also known as **HD 1502**, and **HIP 1547**.

Ebla, mag. 8.63, 23 09 11 -02 15 39, has one transiting planet in orbit. Also known as **HD 218566**, and **HIP 1547**.

Parumleo, mag. 11.3, 00 15 51 +01 12 02, has one transiting planet in orbit. Also known as **WASP-32**.

Deep Sky:

M74 (NGC 628), mag. 9.2, 01 36.7 +15 47, 10.2'x9.5' in size, is a fine, face-on spiral galaxy; round and very large; very small nucleus; two major arms that can be resolved with large instruments. To find, start at **Hamal (Alpha Arietis)** and follow the line from **Alpha** to **Beta Arietis** to **Eta Piscium**. **M74** is 0.5° north and 1.5° east of **Eta Piscium**. Also known as: **PGC 005974**; **UGC 01149**; **CGCG 460-014**; **CGCG 0134.0+1532**; **MCG +03-05-011**; **2MASX J01364177+1547004**; **IRAS 01340+1532**; and **BD +15°238**.

NGC 676, mag. 9.6, 01 50 04 +06 00 45, 4.3'x1.6' in size, is a galaxy that has a very small and bright nucleus; has a bright star superimposed. Also known as: **PGC 006656**; **UGC 01270**; **ARK 057**; **CGCG 412-028**; **CGCG 0146.3+0540**; **MCG +01-05-034**; and **LEDA 006656**.

The rest of the objects of interest are beyond magnitude 10. Here they are:

NGC 524, mag. 10.2, 01 24.8 +09 37, 2.8'x2.8' in size, is a galaxy that is very bright and pretty large. It is located 3.4° northeast of **Zeta Piscium**. Also known as: **PGC 005222**; **UGC 00968**;

CGCG 411-501; **CGCG 0122.1+0917**; **MCG +01-04-053**; **2MASX J01244770+0932196**; and **IRAS 01221+0916**.

NGC 488, mag. 10.3, 01 21.8 +05 15, 5.2'x3.9' in size, is a galaxy that is pretty bright, large, and round; many arms; very bright, diffuse nucleus. Located 1.5° west of the star **95 Piscium** (mag. 7.01). Also known as: **PGC 004946**; **UGC 00907**; **CGCG 411-033**; **CGCG 0119.2+0500**; **MCG +01-04-033**; **2MASX J01214684+0515241**; **IRAS 01191+0459**; and **WBL 037-001**.

NGC 520, “The Flying Ghost”, mag. 12.2, 01 25 41 +03 54 09, 3.18'x1.27' in size. Also known as: **PGC 005193**; **UGC 966**; **H3-253**; **MCG +01-04-052**; **ARP 157**; **VV 231**; **CGCG 041-050**; **CGCG 0122.1+0333**; **2MASX J01243507+0347326**; and **IRAS 01219-0331**.

Pisces Cloud or Pisces Chain, mag. 12.9, 01 07 15 +32 31 13, is a chain of galaxies all within 1° of **NGC 383**. It is composed of the following: **NGC 383**; **382**; **384**; **385**; **380**; **379**; **386**; **387**; **392**; **410**; **394**; **397**; **407**; **414**; **373**; **375**; **388**; **374**; **403**; **399**; and **390**. Also known as **ARP 331**.

3C31 (NGC 383), mag. 13.4, 01 07 25.05 +32 24 45, 101.7" x 87.4" in size, is an active galaxy with a super-massive black hole at its center, with jets that extend for millions of light years in both directions. It is a double radio galaxy having a Quasar-like appearance. Four galaxies are located nearby – **NGC 379**; **380**; **385**; and **384** - that are believed to be closely associated with it. The **NGC 379/380** pair is 5' to the north, and the **NGC 384/385** pair is 5' to the south. Also known as **ARP 331**; **UGC 689**; and **H2-217**.

Andromeda II or Andromeda Dwarf Galaxy, mag. 13.5, 01 16 30 +33 25 m09, 2.0' in size, is located in **Pisces**. Also known as **PGC 004601**, and **[KK98]012**.

Pisces 1 or Pisces Dwarf Galaxy, mag. 14.2, 01 03 56.6 +21 53 41, 2'x2' in size. Also known as **PGC 003792**, **LGS3**, and **LEDA 3792**.

NGC 414, mag. 14.5, 01 12 29 +33 13 32, 0.8'x0.4' in size. Also known as **PGC 004254**, **UGC 00744**, **IV Zw039**, **CGCG 501-123**, **CGCG 0108.5+3250**, **KPG 025**, and **WBL 031-04**.

Mrk 360, “The Teardrop”, mag. 14.7, 01 45 06 +17 10 15, 0.2'x0.2' in size.

CGCG 436-030, mag. 14.9, 0.8'x0.4' in size, is spiral galaxy interacting with **IRAS 01173+1405**, and has an eye-catching curling tail. Also known as **PGC 004798**.

NGC 7459, mag. 15.2, 23 01.74 +06 44, is a twin spiral galaxy with two galactic nuclei only 15" apart. Also known as **2MASX J23004749+0644440**, and **NPM1G +0600584**.

Pisces A, 00 14 46.1 +10 48 46.43, is a void dwarf galaxy.

Asterisms:

Renou 18, mag. 7.0, 01 14.5 +30 00, 18' in size, located 37' east of **Tau Piscium**.

Testudo (The Turtle), is composed of the stars **24, 27, YY (30 Piscium), 33, and 24 Piscium**.

The "Circle of Pisces", "The Southern Fish", 23 31 02.7 +03 36 46.5, 5° in size, composed of the following stars: **Gamma, Kappa, Lambda; Iota; Theta; 7, and TX Piscium**.

Johannes Hevelius divided Pisces into four sub-divisions in his "Firmamentum Sobiescianum" in 1690. Here are the sub-divisions:

Pisces Boreas, "The North Fish", composed of the following stars: **Sigma; 68; 65; 67; Psi¹; Psi²; Psi³; Chi; Phi; Upsilon; 91; T; 82; and 78 Piscium**.

Pisces Austrinus, "The South Fish", composed of the following stars: **Omega; Iota; 9; 7; 8; 5; Kappa; Lambda; TX; Theta; and Gamma Piscium**.

Linum Boreum, "The North Cord", composed of the following stars: **Chi; Rho; 94; VX (97 Piscium); Eta; Pi; Omicron; and Alpha Piscium**.

Linum Austrinum, "The South Cord", composed of the following stars: **Alpha; Xi; Nu; Mu; Zeta; Epsilon; Delta; 41; 35; and Omega Piscium**.

List of Objects in Pisces:

312 NGC; 127 IC; 393 UGC; 339 MCG; 26 ARP; 38 CGCG; 18 Radio Galaxies; 21 Quasars; 19 Abell; 9 Shk; 10 ZwG; 22 VV; 75 Herschel; 1 [PKL98]; 1 [Ao84]; 2 NPM1G; 2 KUG; 6 HCG; 4 AGC; 3 Mrk; 6 MAC; 2 2MASX; 1 DDO; 1 S; 1 Al; 1 Teu; 1 Alessi; 1 Spano; 1 KDG; 1 Ren; 1 Ray; 1 IZw; 2 IIZw; multiple IRAS. Total of 1448+.

Other Stars:

Nu Psc, mag. 4.45, 01 41 25.91 +05 29 15.4, is an orange giant star that was originally designated as **51 Ceti**. Also known as **HD 10380, HIP7884, Gould 125, and 106 Piscium**.

Psi Psc is a double star with a companion. **Psi¹ Piscium**, mag. 5.55, 01 05 41.68 +21 27 55.7, is also known as **HD 6457, HIP 5132, and 74 Piscium**. **Psi² Piscium**, mag. 5.56, 01 07 57.11 +20 44 21.6, also known as **HD 6695, HIP 5310, and 79 Piscium**. **Psi³ Piscium**, mag. 5.57, 01 09 49.20 +19 3930.2, a separation from primary of 30", also known as **HD 6903, HIP 5454, and 81 Piscium**.

19 Psc (TX Psc), mag. 4.95, 23 46 23.54 +03 29 12.7, is a variable carbon star and one of the reddest stars known. It is located 2° north of Lambda Piscium, and 1° east between **Iota and Lambda Piscium**. It is the easternmost star of the **Circle of Pisces**. Also known as **HD 223075, HIP 117245, and Gould 42**.

107 Psc, mag. 5.24, 01 42 29.95 +20 16 12.5, is a main sequence orange dwarf star that has two visual companions. It was originally designated as **2 Arietis**. Also known as **HD 10476, and HIP 7981**.

54 Psc, mag. 5.8, 00 39 21.0 +21 15 01, is an orange dwarf star that has one planet in orbit and one brown dwarf star in orbit. The planet has a separation of 0.28 au (corresponding to the orbit of **Mercury**), and has an orbital period of 52 days. Also known as **HD 3651, and HIP 3093**.

88G Psc, mag. 6.04, 00 28 20.05 +10 11 23.5, is a barium dwarf star. Also known as **HD 2454, and HIP 2235**.

HD 217107, mag. 6.17, 22 58 15.54 -02 23 43.2, is a yellow sub-giant star with two planets in orbit, with orbital periods of 71 days and 8 years. Also known as **HIP 113421, and Gould 6**.

109 Psc, mag. 6.27, 01 44 55.85 +20 05 00.3, has one planet in orbit. Also known as **HD 10697, and HIP 8159**.

HR 515 (VY Psc), mag. 6.55, 01 46 35.27 +17 24 45.7, is designated as **3 Arietis**. Also known as **HD 10845, and HIP 8271**.

65 Psc (i Psc), mag. 7.0, 00 49 53.11 +27 42 37.1, forms a binary system with **HD 4758**. Also known as **HD 4757, and HIP 3885**.

HD 4758, mag. 7.1, 00 49 53.20 +27 42 37.0, forms a binary system with **HD 4757**. Also known as **65 Piscium**, and **HIP 3885**.

HD 217786, mag. 7.80, 23 03 08 -00 25 47, has one planet in orbit. Also known as **HIP 113834**.

HD 4313, mag. 7.82, 00 45 40.36 +07 50 42.1, has one planet in orbit. Also known as **HIP 3574**.

HD 12484, mag. 8.17, 02 02 27.0 +02 48 57, has one planet in orbit. Also known as **HIP 9519**.

HD 5981, mag. 8.25, 01 00 33 +20 17 33, has one planet in orbit. Also known as **HIP 4715**.

HD 4203, mag. 8.68, 00 44 41.20 +20 26 56.1, has two planets in orbit. Also known as **HIP3502**.

HD 3167, mag. 8.94, 00 34 57.5 +04 22 53, has three planets in orbit. Also known as **HIP2736**.

WASP-76, mag. 9.5, 01 46 32.0 +02 42 02, has one transiting planet in orbit.

WASP-181, mag. 10.0, 01 47 10.0 +03 07 59, has one transiting planet in orbit.

Beyond magnitude 10 there are 3 more WASP and one HAT stars that have transiting planets.

List of stars in Pisces:

45 Σ ; 6 $\text{O}\Sigma$; 27 β ; 27 Numbered; 16 A; 2 Hu; 1 Bar; 1 Wei; 1 Hdo; 4 h; 1 Cbl, and 22 Variable.

Total of 153.

Sky Happenings: November, 2020

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

- Nov. 1st - Daylight Savings Time** ends at 2 AM, reverting back to 1 AM CST, Asteroid **Flora** is at opposition at 1 AM CST.
- Nov. 2nd - Evening:** The waning gibbous **Moon** is just shy of 4° from **Aldebaran**.
- Nov. 3rd - Mercury** is stationary at 2 AM CST.
- Nov. 4th - The Moon** is 0.2° north of **M35** at 8 PM CST.
- Nov. 5th - The South Taurid Meteor Shower** peaks at 12 AM CST.
- Nov. 8th - Asteroid Juno** is in conjunction with the **Sun** at 3 AM CST, **Last Quarter Moon** occurs at 7:46 AM CST.
- Nov. 10th - Mercury** is at greatest western elongation (19°) at 11 AM CST.
- Nov. 12th - Dawn:** In the east-southeast before sunrise, the waning crescent **Moon**, **Venus**, and **Spica** are in a curving line 12° long with tiny **Mercury** at the lower left, **The North Taurid Meteor Shower** peaks at 11 AM CST, **The Moon** passes 3° north of **Venus** at 3 PM CST.
- Nov. 13th - Dawn:** The thinnest sliver the **Moon**, **Venus**, **Spica**, and **Mercury** are arranged in a trapezoid, **The Moon** passes 1.7° north of **Mercury** at 3 PM CST.
- Nov. 14th - The Moon** is at perigee (222,350 miles or 357,837 km from **Earth**) at 5:43 AM CST, **New Moon** occurs at 11:07 PM CST.
- Nov. 15th - Venus** passes 4' north of **Spica** at 7 AM CST, **Mars** is stationary at 1 PM CST.
- Nov. 16th - Dawn:** **Venus** and **Spica** continue to adorn the east-southeast horizon before sunrise with less than 4° separating them, with **Mercury** to the lower left.
- Nov. 17th - Morning:** The **Leonid Meteor Shower** predicted peak is at 6 AM CST, with the best viewing in a moonless sky before dawn.
- Nov. 18th - Dusk:** The waning crescent **Moon**, **Jupiter**, and **Saturn** emerge from the gloaming, forming a shallow arc 10° long.
- Nov. 19th - The Moon** passes 2° south of **Jupiter** at 3 AM CST, **The Moon** passes 3° south of **Saturn** at 9 AM CST, **Dusk:** The **Moon**, passed **Jupiter** and **Saturn**, now forms a triangle with them as the trio sink toward the southwest.
- Nov. 21st - First Quarter Moon** occurs at 10:45 PM CST.
- Nov. 23rd - The Moon** passes 5° south of **Neptune** at 6 AM CST.
- Nov. 25th - The Moon** passes 5° south of **Mars** at 2 PM CST, **Evening:** The waxing gibbous **Moon** and **Mars** are less than 5° apart, high in the south-

southwest.

- Nov. 26th** - The **Moon** is at apogee (252,211 miles or 405,894 km from **Earth**) at 6:29 PM CST.
Nov. 27th - The **Moon** passes 3° south of **Uranus** at 11 AM CST.
Nov. 29th - **Neptune** is stationary at 3 AM CST,
 Dawn: The almost-full **Moon** is between the **Hyades** and the **Pleiades**.
Nov. 30th - **Penumbral Lunar Eclipse**, visible to all of North America, starts at 1:32 AM CST, the
 greatest depth at 3:43 AM CST, and exiting **Earth's** shadow at 5:53 AM CST,
Full Moon occurs at 3:30 AM CST.
Dec. 1st - The **Moon** is 0.2° north of **M35** at 2 AM CST.

Planets:

Mercury – **Mercury** will be visible all month. At magnitude 1.6, it will appear as a tiny crescent on the 1st of November. On the 2nd, the planet will brighten to magnitude 0.9 with a 21% illuminated disk with a diameter of 8.6", and will be 4° to the left of **Spica**, an hour before sunrise. On the 10th, the planet achieves greatest western elongation (19°) from the **Sun**, at magnitude 0.5, standing 13° high at 6:15 AM local time. During the month, the planet will be 16% lit on the 1st, 50% lit on the 8th, and 85% lit by the 20th, with the disk's diameter shrinking from 9" to 6" during the month. On the 13th, the planet, shining at magnitude 0.7, will be 5° below a slender crescent **Moon** in the predawn sky, with **Venus** 8.5° west of the **Moon**.

Venus – On November 1st, **Venus** will rise in **Virgo** soon after 4AM local time, at magnitude -4, with the star **Zaniah (Eta Virginis)** just 20' away. Each day the planet moves more than 1° along the ecliptic. On the 5th, the planet is 1° from **Porrima (Gamma Virginis)**. On the 12th, an hour before sunrise, a crescent **Moon** is 6.5° away, with **Theta Virginis** only 18' from the planet. On the 15th, the planet is 4° due north of **Spica**. The planet will dim by 0.1 magnitude as it crosses the rest of **Virgo** to reach **Libra** on the 20th. On the first, the planet will show a 13" wide disk at 82% illumination. By the 30th, the disk is 12" wide and is 89% illuminated.

Mars – **Mars** starts the month high in the east an hour after sunset, at magnitude -2.1, in **Pisces**. The planet continues retrograde movement until the 15th, when it becomes stationary, and will then resume eastward motion. The planet, as it recedes from **Earth**, will dim to magnitude -1.1, with its diameter shrinking from 20" to 15" by month's end. Its phase will change from 98% to 92% illuminated. The next time the planet will reach an apparent diameter over 20" will be in 2033 – for the **Southern Hemisphere**, the **Northern Hemisphere** will have to wait until 2035.

Jupiter – **Jupiter**, at magnitude -2.2 on November 1st, will be low in the southwest. The planet will dim by 0.1 magnitude in one week. The disk spans 37", and will shrink to 34" by month's end. The planet is near the meridian at sunset as the month starts, but gets lower and farther west when darkness falls as the month progresses. **Jupiter** and **Saturn** start the month with a separation of 5.1° in eastern **Sagittarius**, and cross into **Capricornus** in late December. By month's end, the two planet's separation is only 2.3°.

Saturn – **Saturn**, sitting east of **Jupiter**, is at magnitude 0.6, with a disk of 16.3" that will diminish to 15.7" by the end of the month, with the rings tilted towards **Earth** by 22°. **Saturn** and **Jupiter** travel across eastern **Sagittarius** during the month, starting with a separation of 5.1°, and as the month progresses, the separation decreases. **Saturn's** moon **Titan**, at 8th magnitude, is due north of the planet on the 3rd and 20th, and due south on the 11th and 27th. The trio of 10th magnitude moons, **Tethys**, **Dione**, and **Rhea**, are closer in to the planet, and even closer to the ring's edge is the 12th magnitude moon **Enceladus**. The moon **Iapetus** will reach greatest western elongation on the 4th, appearing at its brightest near magnitude 11 as it moves to superior conjunction on the 25th.

Uranus – **Uranus** is one day past opposition (on October 31st) on November 1st, and will be visible all night at magnitude 5.7. The planet is located in a bland region 10.5° southeast of **Hamal (Alpha Arietis)**. To locate the planet, start at **Hamal**, and follow a meandering line of 5th magnitude stars to the star **19 Arietis**. The planet is 3° southeast of the star on the 1st, and 2.5° southeast on the 30th. A telescope will reveal a bluish-green disk 4" wide.

Neptune – **Neptune** is within 1° of the 4th magnitude star **Phi Aquarii** all month long. The planet drifts westward until the 29th, when, at magnitude 7.9, it reaches its stationary point 44' east-northeast of **Phi Aquarii**. To locate, use a pair of binoculars – you will that in the same field of view is a pair of 6th

magnitude stars forming a triangle with **Phi Aquarii** – the pair of stars are twice as far from **Phi Aquarii** as the planet, with the planet in the center of the triangle. A telescope will reveal the planet’s bluish disk spanning 2”.

Pluto – **Pluto**, shining at magnitude 14.6, is in **Sagittarius**, 41’ due south of **Jupiter** on November 12th.

Moon – The waning crescent **Moon** is 6’ above **Venus** on the morning of the 12th, and on the 13th it is between **Venus** and **Mercury** in a pattern that includes **Spica**. On the evenings of the 18th and 19th, the waxing crescent **Moon** skips past **Jupiter** and **Saturn** and then, as a waxing gibbous, it will lie a few degrees below **Mars** on the 25th. In the predawn or dawn hours of the 30th, **North America** will see a penumbral eclipse of the **Moon**.

Favorable Librations: **Lacus Veris** on the 5th; **Shaler Crater** on the 8th; **Schickard Crater** on the 11th; and **Vestine Crater** on the 21st.

Greatest North declination on the 6th (+24.8°)

Greatest south declination on the 18th (-24.7°)

Libration in longitude: East limb most exposed on the 20th (+7.5°)

West limb most exposed on the 8th (-7.4°)

Libration in latitude: North limb most exposed on the 24th (+6.8°)

South limb most exposed on the 11th (-6.7°)

Asteroids – Asteroid **1 Ceres** – **Ceres** positions, according to the *RASC Observer’s Handbook, 2020 USA Edition*, are as follows: On November 7th – 22 24.63 -23 07.8, at magnitude 8.8; on the 17th – 22 28.94 -22 03.6, at magnitude 8.9; and on the 27th – 22 35.09 -20 51.0, at magnitude 9.0. **Ceres** positions, *by my estimates*, are as follows: On November 1st – about 2.1° south and a little east of

47 Piscis Austrini; on the 5th – about 1.8° south-southeast of **47 Piscis Austrini**; on the 10th – about 1.5° southeast of **47 Piscis Austrini**; on the 15th – about 1.9° east-southeast of **47 Piscis Austrini**, or 1.3° southwest of **NGC 7293 (The Helix Nebula)**; on the 20th – just under 1° southeast of **NGC 7293**, or about 1.3° southwest of **Nu Piscis Austrini**; on the 25th – about 0.3° due south and a little west of **Nu Piscis Austrini**; and on the 30th – about 1° west-southwest of **Nu Piscis Austrini**.

Asteroid **4 Vesta** – **Vesta**’s positions, according to the *RASC Observer’s Handbook, 2020 USA Edition*, are as follows; On November 7th – 10 34.17 +12 34.0, at magnitude 8.1; on the 17th – 10 47.74 +11 41.2, at magnitude 8.0; and on the 27th – 11 00.26 +10 20.0, at magnitude 7.9.

Asteroid **8 Flora** – **Flora**’s positions, according to the *RASC Observer’s Handbook, 2020 USA Edition*, are as follows; On November 7th – 02 36.08 +02 57.6, at magnitude 8.0; on the 17th – 02 27.02 +02 54.6, at magnitude 8.2; and on the 27th – 02 20.6 +03 17.5, at magnitude 8.5. **Flora**’s positions, *by my estimate*, are as follows: On November 1st – about 0.7° due west and a little south of **Gamma Ceti**; on the 5th – just over 1.5° due west and a little more south of **Gamma Ceti**, or 6° due south and a little west of **R Ceti**; on the 10th – 3° due west and a little south of **Gamma Ceti**, or 3° due south and a little west of **R Ceti**; on the 15th – 4.2° due west and a little south of **Gamma Ceti**, or 3° due north and a little west of **R Ceti**; on the 20th – just under 11° due west of **Gamma Ceti**, or just under 3° due north and a little east of **69 Ceti**; on the 25th – just over 3° due north and a little west of **69 Ceti**; and on the 30th – about 3.6° north-northwest of **69 Ceti**.

Asteroid **15 Eunomia** – **Eunomia**’s positions, in **Cancer**, according to the *RASC Observer’s Handbook, 2020 USA Edition*, are as follows: On November 7th – 08 39.14 +21 00.2, at magnitude 9.8; on the 17th – 08 45.07 +20 05.8, at magnitude 9.6; and on the 27th – 08 48.17 +19 17.4, at magnitude 9.5.

Asteroid **16 Psyche** – **Psyche**’s positions, according to the *RASC Observer’s Handbook, 2020 USA Edition*, are as follows: On November 17th – 05 18.72 +18 25.0, at magnitude 9.8; and on the 27th – 05 10.69 +18 12.7, at magnitude 9.6.

Asteroid **471 Papagena** – **Papagena**’s positions, according to the *RASC Observer’s Handbook, 2020 USA Edition*, are as follows; On November 7th – 02 20.3 -06 37.8, at magnitude 9.5; on the 17th – 02 11.83 -05 42.0, at magnitude 9.7; and on the 27th – 02 05.46 -04 21.4, at magnitude 9.8.

Asteroid **Erris** will be about 12° southeast of **Mars**, 2° north of a field star – **HIP 7999** – in northern **Cetus**, at magnitude 19.

Comets – Comet **88P/Howell** – **Howell’s** positions, according to **ALPO**, are as follows: On November 10th – 19 23.7 -25 58, at magnitude 9.4 in **Sagittarius**; on the 20th – 20 01.1 -24 23, at magnitude 9.8 in **Sagittarius**; and on the 30th – 20 36.4 -22 20, at magnitude 10.1 in **Capricornus**.

At mid-month **Howell** will glide 3.5° below **Jupiter** and **Saturn** by almost 1° per day. **Howell’s** positions, *by my estimates*, are as follows: On November 1st – about 1° southwest of **Alpha Virginis (Nunki)**; on the 5th – about 1.5° due north of **Tau Virginis**; on the 10th – about 5.5° northwest of **M55**; on the 15th - 6° north-northeast of **M55** Note: Jupiter will be about 9° due north of **M55** with **Saturn** 4° to the left of **Jupiter** (about 3° west-northwest of **M75**), and **Pluto** will be less than 1° south-southwest of **Jupiter**; on the 20th – about 4° due south of **M75**; on the 25th – about 4° east-southeast of **M75**, or just under 6° northwest of **Psi Capricornus**; and on the 30th – a little over 3° north-northwest of **Psi Capricornus**.

Comet **141P/Machholz** – **Machholz’s** positions, according to **ALPO**, are as follows: On November 10th -18 50.7 -10 35, at magnitude 14.9 in **Scutum**; on the 20th – 19 22.9 -10 24, at mag. 13.9 in **Aquila**; and on the 30th – 20 00.0 -10 03, at magnitude 12.9 in **Aquila**.

Meteor Showers – There are two Class I meteor showers active in November – The **Orionids**, active from September 23rd through November 27th, peaked on October 22; and the **Leonids**, active from November 2nd through November 30th, peaking on November 18th with a maximum zenith hourly rate (mzhr) of 23.

There are five Class II meteor showers active in November: the **Leonis Minorids**, active from October 12th through November 5th, peaked on October 23rd; the **Southern Taurids**, active from October 24th through December 19th, peaked on October 30th; the **Northern Taurids**, active from October 24th through December 19th, peaks on November 3rd with a mzhr of 5; the **November Orinids**, active from November 7th through December 17th, peaks on November 29th with a mzhr of 3; and the **Sigma Hydrids**, active from November 24th through December 21st, peaks on December 6th with a mzhr of 3.

There is one Class III meteor shower (variable mzhr) active in November, the **Alpha Monocerotids**, active from November 21st through November 23rd, peaking on November 21st.

There are nine Class IV meteor showers active in November: the **Chi Taurids**, active from October 20th through November 17th, peaks on November 4th with a mzhr <2; the **Southern Lambda Draconids**, active from November 1st through November 4th, peaks on November 4th with a mzhr ,2; the **Omicron Eridanids**, active from October 16th through November 24th, peaks on November 5th with a mzhr <2; the **Andromedids**, active from October 26th through November 17th, peaks on November 6th with a mzhr <2; the **Kappa Ursae Majorids**, active from November 3rd through November 10th, peaks on November 8th with a mzhr <2; the **November Theta Aurigids**, active from November 17th through December 1st, peaks on November 26th with a mzhr <2; the **December Phi Cassiopeiids**, active from November 28th through December 10th, peaks on December 4th with a mzhr of <2; the **December Alpha Draconids**, active from November 30th through December 15th, peaks on December 8th with a mzhr of <2; and the **December Sigma Virginids**, active from November 30th through December 31st, peaks on December 13th with a mzhr of <2.

The annual **Leonids** had a strong outburst in 2002, when 3,000 meteors an hour blazed across the sky. According to the *American Meteor Organization*, this will not be repeated until 2099, when **Earth** will again pass through the dense strand of debris shed by the shower’s parent, Comet **55P/Temple-Tuttle**. A moderately rich **Leonid** displays of around 100 meteors an hour are also expected when the comet returns in 2031 and 2064. This year the conditions are ideal for the **Leonids** – the shower will peak in a moonless sky at around 6 AM CST on the morning of November 17th. The radiant will stand high in the southeast sky between 3 and 5:30 AM local time.

The **Northern Taurids** and the **Southern Taurids** are derived from comet **2P/Encke**, and produce a handful of meteors per hour at best – despite their low rates, both streams are fireball rich.

When to View the Planets:

Evening Sky

Mars (east)
Jupiter (south)

Midnight

Mars (southwest)
Uranus (southwest)

Morning Sky

Mercury (east)
Venus (east)

Saturn (south)
Uranus (east)
Neptune (southeast)

Neptune (west)

Uranus (west)

DARK SKY VIEWING · PRIMARY ON NOVEMBER 11TH, SECONDARY ON NOVEMBER 21ST



Pisces – The Fishes

The mythological events concerning this constellation are said to have taken place around the Euphrates River, a strong indication that the Greeks inherited this constellation from the Babylonians. The story follows an early episode in Greek mythology, in which the gods of Olympus had defeated the Titans and the Giants in a power struggle. Mother Earth, also known as Gaia, had another nasty surprise in store for the gods. She coupled with Tartarus, the lowest region of the Underworld, where Zeus had imprisoned the Titans, and from this unlikely union came Typhon, the most awful monster the world had ever seen.

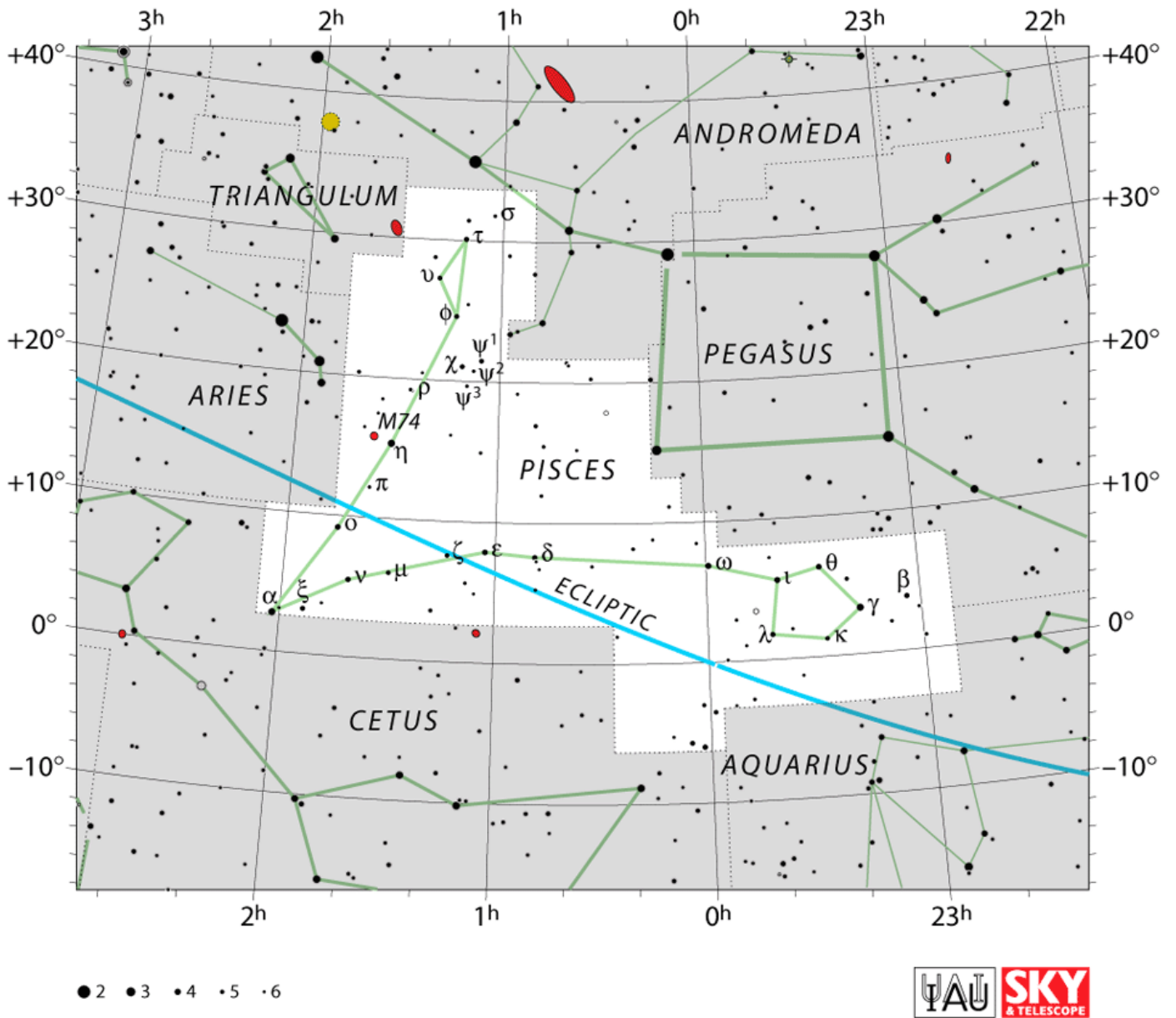
According to Hesiod, Typhon had a hundred dragon’s heads from which black tongues flicked out. Fire blazed from the eyes in each of these heads, and from them came a cacophony of sound: sometimes ethereal voices which gods could understand; while at other times Typhon bellowed like a bull, roared like a lion, yelped like puppies, or hissed like a nest of snakes.

Gaia sent this fearful monster to attack the gods. Pan saw him coming and alerted the others with a shout. Pan himself jumped into the river and changed his form into a goat-fish, represented by the constellation Capricornus, also inherited from the Babylonians.

Aphrodite and her son Eros took cover among the reeds on the bank of the Euphrates, but when the wind rustled the undergrowth, Aphrodite became fearful. Holding Eros in her lap, she called for help to the water nymphs and leapt into the river. In one version of the story, two fishes swam up and carried Aphrodite and Eros to safety on their backs, although in another version the two refugees were themselves changed into fish. The mythologists said that because of this story, the Syrians would not eat fish. An alternate story, given by Hyginus in the *Fabulae*, is that an egg fell into the Euphrates and was rolled to the shore by some fish. Doves sat on the egg and from it was hatched Aphrodite who, in gratitude, put the fish in the sky. Eratosthenes wrote that the fish, represented by the constellation Pisces, were offspring of another fish that is represented by the constellation Piscis Austrinus.

In the sky, the two fish of Pisces are represented swimming in opposite directions, their tails joined by a cord. The Greeks offered no good explanation for this cord, but according to the historian Paul Kunitzsch, the Babylonians visualized a pair of fish joined by a cord in this area of the sky. So evidently the Greeks borrowed this idea although the significance of the cord was lost.

Pisces is a disappointingly faint constellation, its brightest stars being only of 4th magnitude. Alpha Piscium is called Al Rescha, from the Arabic name meaning “the cord”. It lies where the cords joining the two fish are knotted together. Pisces is notable because it contains the point at which the Sun crosses the celestial equator into the northern hemisphere each year. This point, called the Vernal Equinox, originally lay in Aries, but it has now moved into Pisces because of the slow wobble of the Earth on its axis, called precession.



The End