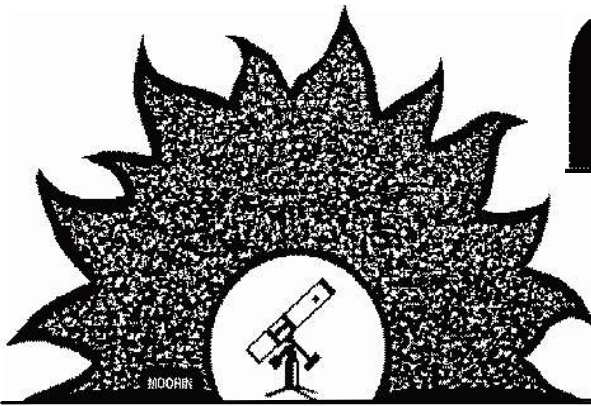




PAStimes

Phoenix Astronomical Society

www.pasaz.org

March 2023

Volume 74 Issue 6

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

TOM KLARE TO SPEAK AT MARCH 2ND MEETING

“Photographing Stars with a Digital Camera”

By Tom Klare

Our guest speaker Tom Klare is an award-winning photographer and art professor emeritus. He will explain how you can photograph star fields over a night landscape using your own Digital SLR or Mirrorless Digital Camera. He will also demonstrate effective post-production techniques for finalizing your star images.

Tom’s photography work has ridden aboard a SpaceX Dragon Capsule, has been used by National Geographic and The Nature Conservancy plus many others. His images have won international awards through Prix de la Photographie Paris, IPA, ND and Budapest International Foto Awards.

Before coming to Arizona to teach,

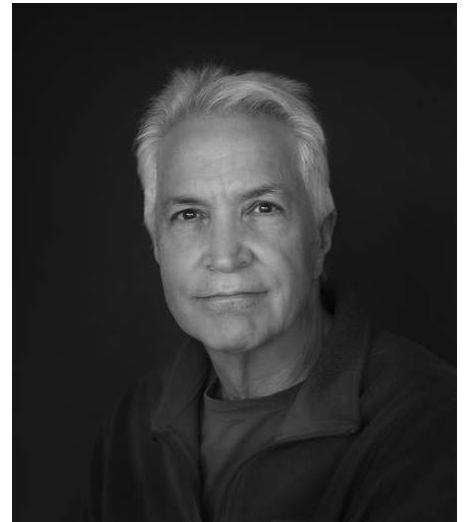
Tom shot commercial and editorial photography in Southern California for 20 years. He currently teaches photography workshops for Arizona Highways Photoscapes. His photography work can be seen at: www.tomklare.net Instagram: @klaretr

March PAS Meeting

By Terri Finch, Event Manager

Please join us in Welcoming Tom Klare to the March PAS Meeting with his exciting presentation on “Photographing Stars with a Digital Camera.” Doors open at 7:00pm at PVCC Main Campus in LS-205 and the presentation begins at 7:30pm with a few brief announcements by President Stu, and then our Guest Speaker takes the floor. You do not want to miss this presentation. If you can not make it in-person, please visit this meeting, live via Zoom. Meeting at this

See “Photographing Stars” in the Middle of Page 5.



TOM KLARE IS THE MARCH GUEST SPEAKER. HE WILL BE DOING HIS PRESENTATION IN PERSON. THERE IS A MEET & EAT DINNER PRIOR TO THE MEETING AT 5PM. SEE WEBSITE FOR DETAILS. RSVP REQUIRED.

THE ASTRONOMICAL LEAGUE

A Lecture by Alex Vrenios

by Stu Brackney

A long time and well-known PAS member, Dr. Alex Vrenios was our speaker for the February PAS Lecture Series meeting. Using his talents with ZOOM, Alex whose knowledge is appreciated by many people who are experts in the field of astronomy, not only taught us all about the national organization known as The Astronomical League (AL), he prepared an amazing assortment of slides that demonstrated many of the “observing programs” offered by the League that he has participated in over the years. This man is a sponge when it comes to learning new topics, and a professor when it comes to sharing them.

Since joining PAS in 2008, he has written several articles for the club’s

newsletter and made many presentations to the PAS membership. He is a Lifetime member of the AL, where he completed over a dozen programs. He is a retired computer scientist with dozens of technical papers and a book to his credit. He recently served as PAS Secretary.

If you missed his lecture, visit www.pasaz.org and click on the link to “Videos of Speaker Presentations” under PAS Meetings. You won’t be disappointed as he received a standing ovation.



DR. ALEX VRENIOS, PAS LIFETIME MEMBER AND MEMBER OF THE ASTRONOMICAL LEAGUE. PHOTO PROVIDED BY ALEX.

President	Stu Brackney	480-221-5711	President@pasaz.org
Vice President	Paul Facuna	602-246-1554	VicePresident@pasaz.org
Webmaster	Pete Turner		Webmaster@pasaz.org
Acting Secretary	Stu Brackney	602 789-6556	Secretary@pasaz.org
Treasurer	Richard Sauerbrun		Treasurer@pasaz.org
Event Manager	Terri Finch	602-561-5398	Events@pasaz.org
Membership Manager	Joe Sandy		Membership@pasaz.org
Newsletter Editor	Don K. Boyd		Editor@pasaz.org
PAS Host			
Member at Large			
Member at Large/Equipment Manager	Bruce Wurst	602-909-8024	mail@pasaz.org
Phoenix Astronomical Society 3241 E Shea Blvd #249 Phoenix AZ 85028-3365			

PAST PAS RECORDED PROGRAMS

By Terri Finch, Event Manager

Did you miss a PAS Meeting and wish you could see it? You can get to the link of Past Recorded PAS Meetings with Guest Speakers any time by going to the left hand navigation tool on the PASaz.org website and clicking on "PAS Monthly Meetings." From there a drop down item will appear and please click on "Videos of Speaker Presentations." You will then find recordings of Past PAS Meetings for your viewing pleasure. The collection is in oldest to newest order. Please work your way to the bottom of the collection to find the most recently recorded PAS Guest Speaker Presentation.

As long as PAS can record the PAS Meetings, PAS will continue to add more recordings to this page. Here is the direct link to the recorded PAS Meetings collection: <https://www.pasaz.org/pas-monthly-meetings/videos-of-speaker-presentations>. Enjoy!

TABLE OF CONTENTS

1 "PHOTOGRAPHING STARS" AT MARCH 2ND MEETING	5 WHY DO YOU NEED TO RSVP
1 "THE ASTRONOMICAL LEAGUE" AT FEB 2ND MEETING	6 THE STAR BARN - A LOCAL FREE PLANETARIUM
2 WHAT'S UP FOR MARCH	7 THE PAS GALACTIC GAVEL
2 MOON PHASES OF MARCH	8 SPOT THE KING OF PLANETS: OBSERVE JUPITER
2 PAST PAS RECORDED PROGRAMS	9 "EXPLORING THE MYSTERIES OF THE UNIVERSE: A JOURNEY THROUGH ASTRONOMY"
2 PHOENIX ASTRONOMICAL SOCIETY CONTACT INFO	9 PLACE YOUR ASTRONOMY EQUIPMENT AD IN THIS NEWSLETTER
2 TABLE OF CONTENTS	9 JAN 28TH PUBLIC STAR PARTY
3 PAS GUEST SPEAKERS AT HYBRID MEETINGS	9 ORION NEBULA PHOTO
3 THANKS TO THE STAR TOURS TEAM	10 STORY TIME: MESSY AND MESSIER
4 PAS ELECTION SCHEDULE	11 CAREFREE STAR PARTY JAN 21ST
4 STU'S VIEWS MARCH 2023	11 NOMINATIONS BY EMAIL
4 UPCOMING MARCH EVENTS	11 ORION NEBULA PHOTO
4 PRAISE FOR THE NEWSLETTER TEAM	12 VILLA DE PAZ SCHOOL JAN 27
4 A BRIEF LOOK AT APRIL'S SCHEDULE	12 DESERT HARBOR SCHOOL JAN 25
5 MEET & EAT DINNER BEFORE MAR 2 MEETING	12 MESSIER MARATHON
5 PHOTOGRAPHING STARS (FROM PAGE 1)	12 MESSY AND MESSIER (FROM PAGE 10)
5 THE INFRARED UNIVERSE BEYOND HUBBLE: THE JAMES WEBB SPACE TELESCOPE!	13 OBSERVE VENUS
	14 NAVIGATING THE MARCH NIGHT SKY
	15 HOW TO FIND MIZAR ON A MARCH EVENING

Bold items Listed in TOC are Upcoming Public & Private Events

WHAT'S UP FOR MARCH

Name	Date	Rise	Set
Mercury	03-15-23	06:43	18:25
Venus	03-15-23	08:11	21:13
Mars	03-15-23	11:19	01:54
Jupiter	03-15-23	07:39	20:18
Saturn	03-15-23	05:41	16:39
Uranus	03-15-23	09:04	20:36
Neptune	03-15-23	03:46	18:34
Pluto	03-15-23	04:09	14:06

All Times Arizona Time UT-7

Bold means the object is "visible" in the evening

PAS is incorporated in the state of Arizona as a non-profit, scientific and educational 501(c)(3) organization. Our newsletter PAStimes is published monthly from September to May and distributed via the Internet. All Issues are available for download on our website www.pasaz.org. Ads for astronomy equipment are provided as a courtesy to sellers and buyers, and do not constitute any endorsement by PAS. All Photos by Don Boyd unless otherwise credited. All articles and photos are copyright their authors or PAStimes.

MARCH 15, 2023

Sunrise: 6:39

Sunset: 18:37

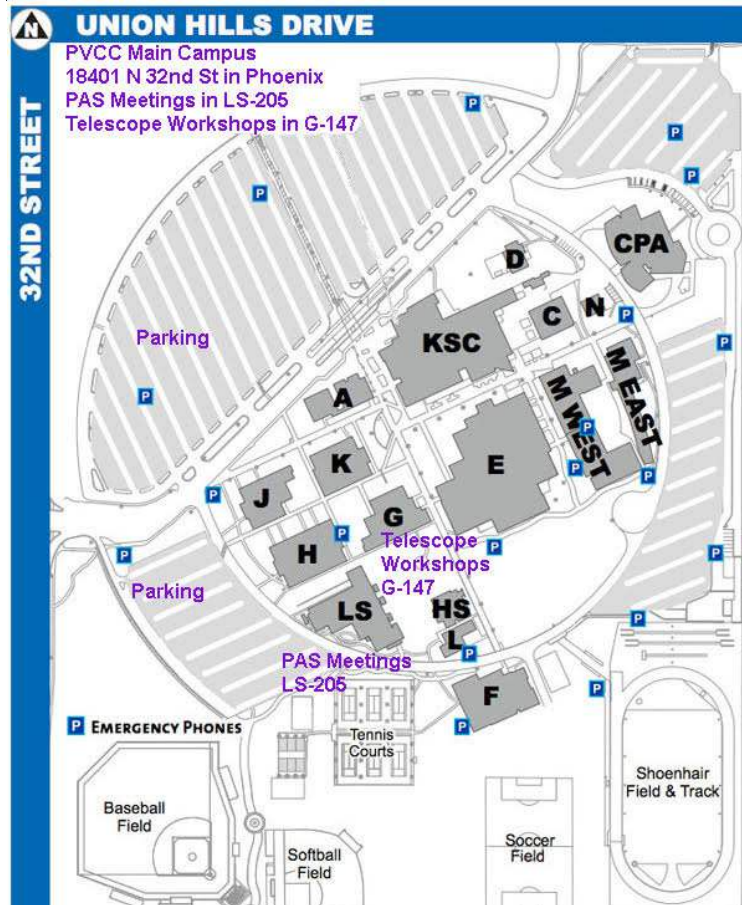
Full: March 7

Q3: March 14

New: March 21

Q1: March 28





2023 PAS GUEST SPEAKERS AT HYBRID MEETINGS

By Terri Finch, Event Manager - Events@pasaz.org

All PAS Meetings with a Guest Speaker held at PVCC can be attended in-person as well as via Zoom at the same time in a hybrid meeting. Those of you wishing to attend the meeting in person, please meet in LS-205 at PVCC Main Campus (map to the left of this article). If you wish to watch the meeting via Zoom, that option is available. For the 2022-2023 school year, PAS is using the same Zoom Meeting Link: <https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09> Please visit the PAS calendar at www.PASaz.org to find out more about these upcoming meetings and guest speakers. For a complete list of guest speakers visit: <https://docs.google.com/document/d/1OO-UpaYNvw3p7JCRXCKSjDcbsK60DnvWOoifbqPrNp8/edit?usp=sharing>

Do you have an idea for a guest speaker? Email the details and contact info for the possible guest speaker to Paul Facuna at VicePresident@pasaz.org.

Here are the next scheduled guest speakers at PAS:

Apr 6: Mark Johnston "My Journey in Astronomy Outreach"

May 4: Tom Sharp "Shock effects in meteorite"

Sept 7: TBA

A BILLION SUNS THANKS TO THE STAR TOURS TEAM

By Terri Finch, Event Manager of PAStimes
Star Tours Team

What is the Star Tours Team? PAS provides astronomers and their observing equipment to private parties, corporate events, school and Scouting events and just about any event you can think of. The PAStimes Star Tours Team is the group of astronomers, who are PAS members, who have qualified to show objects in the night sky at events and receive financial compensation. This Team is always looking for more PAS members to join and take part in educating the public (Public Outreach).

I wish to thank my Telescope Team (Star Tours Team) more than they can ever know. Without them going out and sharing the night sky with the public, PAS would not be as IN DEMAND for astronomers as it is. The Current Team consists of Terri Finch (myself), Storm Moon, Mason Klenklen (newest member), Ted Blank, Bruce Wurst, Roger Anzini, and Mike Marron and all his awesome Meteorites.

Now and then Mark Johnston does PAS events. These fantastic telescope Team members educate and entertain the public with knowledge of our Cosmos. They deserve tons of thanks for all they do and the many events they attend, even when it is more than 100 degrees outside, or so cold your bones are freezing.

How does this work? An organization, a School for example, gets in touch with me, the Event Manager. I reach out to the school, tell them what is involved, and how much it will cost to have PAS at their event as a price per scope. Then, I find out which of my telescope team members are available that night and want to do this event. Once I have a team set up, I confirm with the school on the number of telescopes and if they want Mike with his Meteorites to attend, and we get it all set up. Then the Telescope team does the event and everyone is happy. The only thing PAS can not do for the school (as the customer) is keep the skies clear. This past December

and January clouds canceled a lot of events and so I had to reschedule them in February and March 2023.

PAS is looking for an Event Manager to take my place as I wish to retire from this position. It's a lot of fun, but it is also time consuming. Whoever takes over as Event Manager for PAS needs to know it will eat up your time. I used to do it with a full-time job plus teaching music every evening. Back then, there were fewer schools and organizations wanting PAS to do star parties. PAS is available and busy with events all the time. As a member of the public or PAS who isn't involved in the Star Tours events, you may not be aware that these events help support PAS with a little extra income and a lot of fun for those who are doing these events. Come be part of the Team. Reach out to either our President Stu at President@pasaz.org, or myself, Terri at Events@pasaz.org to find out more about the Star Tours Team or becoming the next Event Manager for PAS!!!

STU'S VIEWS MARCH 2023



President Stu Brackney

Hi everyone. The winter nights of March will provide us sky gazers lots to see. Our PAStimes newsletter has maps of these skies for your use when you head out for that celestial gazing experience. So, get ready for some fun viewing!

Lots to share. Our membership is growing, as we near 100 (yep one hundred)! But why the growth you ask. Well, we have an active organization with monthly meetings at Paradise Valley

Community College that are online simultaneously via ZOOM. We call those meetings hybrid events. We have an active Facebook site, as well as our own website www.pasaz.org. We also have a Meetup presence that is updated with public events as they become scheduled. Reaching out to the public is one of our main missions, plus providing our membership with learning and fun activities, such as the monthly lectures, telescope workshops, social events and hopefully, on a regular basis, star parties.

We accomplish this through the hard work of our board members and Event Manager. In past editions of our newsletter the PAStimes, we have been introducing you to these busy people, which leads me to the next update, Elections. We hold elections every year in May at our annual meeting, scheduled for May 4th. If you wish to be a candidate for

the board of directors you will need to send the position which you are applying for and a brief biographical outline of yourself to Mr. Don Boyd, Editor of our newsletter at editor@pasaz.org. Send a photo of yourself. Your deadline to accomplish this is March 10, 2023. It is just around the corner, so make it happen soon.

By the way we have three manager positions that are appointed by the president. One of those positions, the Event Manager, needs a volunteer. If you are interested, please contact me president@pasaz.org. Our secretary position is also vacant, so if you are interested in that volunteer position, again contact me.

Finally, you, the members, know what you like and want from an organization, so let me know what you want us to do for you. It's easy... send me your requests and suggestions at president@pasaz.org. Until next time...the stars above you are waiting to fill you with wonder! Stu

UPCOMING MARCH EVENTS

By Terri Finch, Event Manager

Mar 2: We have an exciting Presentation by our next Guest Speaker: Tom Klare. Bring the whole family and enjoy this meeting with us. It's in person and virtual, via Zoom, for your convenience.

Mar 9: Our Next Free Telescope Workshop is happening March 9th. RSVP is required. Bring your telescope to learn

how to use it, or come find out what telescope to purchase based on what you wish to do with it. It's all for FREE, but an RSVP is required, as Seating is Limited.

Mar 18: For PAS Members Only - Night Sky Training Session. The details of this event will be in the MS365 Private Calendar. This is an event set up to help PAS Members learn to navigate the night sky as well as compare eyepieces, filters,

and other facets of telescope viewing. PAS Members may bring their family members. RSVP is required.

This list rounds out the month of March for PAS. Hope to see you at these fun events. And watch the PAS calendar for more events to be added that didn't make it into this newsletter at www.pasaz.org and then go to the Public Calendar in the left hand navigation bar.

PRAISE FOR THE NEWSLETTER TEAM

By Richard Sauerbrun, PAS Treasurer

Yet another wonderful newsletter... great job guys. This alone is worth the

price of admission to PAS. You can download many of our club newsletters at

this link: <https://www.pasaz.org/newsletters>

A BRIEF LOOK AT APRIL'S 2023 SCHEDULE

By Terri Finch, Event Manager

April will be here before you know it, so I thought we could look ahead at upcoming events you may wish to attend.

Apr 6: PAS Meeting with Mark Johnston. This will be a fascinating

presentation. You don't want to miss it, either in-person or virtually.

Apr 13: Free Telescope Workshop.

Apr 22: Public Star Party - more details to come. Put this on your calendar

and come join us. It will be spectacular!

Hope to see you at these upcoming, fun, family friendly and kid friendly PAS events. Find more events at www.pasaz.org.

PAS OFFICER & DIRECTOR ELECTION SCHEDULE

Feb. 27: Nomination forms sent via email

March 6 6:00 p.m.: Deadline to submit your Nominations.

April 19: Ballot sent to all active

members

April 27 6:00 P.M.: Voting closed

May 4: Election results announced at meeting

PAS Members, please watch your email for these important items and help PAS pick the 2023-2024 PAS Board Members.

THE INFRARED UNIVERSE BEYOND HUBBLE: THE JAMES WEBB SPACE TELESCOPE!

A Lecture by Professor Rogier Windhorst, PhD

A Review by Stu Brackney

It was Christmas day 2021, when a rocket blasted off from French Guiana for a target one million miles into outer space. This rocket was carrying a telescope, but not just any telescope, it was carrying the James Webb Space Telescope, JWST as the pros call it. This piece of amazing equipment has taken thirty years of planning and construction to get to Christmas morning and now it is parked in space taking in data and images never seen before by humankind.

Professor Rogier Windhorst, PhD was our guest lecturer on January 19th. No stranger to PAS, Dr. Windhorst has delivered numerous lectures to our membership. This one was truly amazing! He hypnotized us with his visual presentations describing the construction of the JWST, its trip south to the launch

pad and its flight path to its current location one million miles away.

I truly cannot say enough about this excellent lecture therefore I strongly recommend that you view it on our website www.pasaz.org under the heading "PAS Monthly Meetings – Videos of Speaker Presentations."

Professor Windhorst is a professor of physics and astronomy and Regent's Foundation Professor at Arizona State University and Interdisciplinary Scientist for the James Webb Space Telescope.

Thank you, professor! We look forward to a return visit with more JWST news!!!



AT THE JANUARY 19TH PAS MEETING, ROGIER WINDHORST SHARED CURRENT INFO ABOUT THE JWST. PHOTO PROVIDED BY ROGIER.

Continued from page 1

link: <https://us02web.zoom.us/j/81193628193?pwd=NIBZN2IU204VnVySk5SZXhtZWc2UT09>

Meet & Eat Dinner at 5pm prior to the March 2nd meeting

By Terri, Event Manager
Our Guest Speaker will be having

PHOTOGRAPHING STARS

dinner with PAS at a location of his choice and announced on the PASaz.org website online calendar for Feb 2nd. RSVP is highly requested so that we can make sure you have room at the PAS table to join us and chat with the Guest Speaker. It's a Pay-For-Your-Own-Dinner gathering and donations towards helping pay for the Speakers' dinner are appreciated. PAS will cover the Speaker's dinner bill

through Terri. We hope you can attend this dinner before the meeting. They do not happen that often. RSVP to Events@pasaz.org with the number in your party. See you there! ***

WHY DO YOU NEED TO RSVP FOR EVENTS?

By Terri Finch, Event Manager

Electronics fill our lives. It used to be that people would call in to the place holding the event to make a reservation to attend. And this reservation could be for 1) the number of seats, or 2) in case bad weather cancels the event, or other reasons, maybe 3) towards getting funding from someplace and the number of heads that attend contribute to how much of a grant is given. Whatever the reasoning, the event PAS was going to hold on Feb 16, 2023 at PVCC which was a Free Telescope Workshop... needed an RSVP to attend. Twelve Students (and anyone they would have brought with

them on this night) and eight PAS Teachers were scheduled to meet at PVCC for the workshop. It was a full house, meaning the capacity of the classroom we hold this event in, would be at maximum capacity with all the teachers and students.

I wish to apologize to anyone who's schedule and plans of attending this event got messed up. For reasons out of PAS's control, this event had to be canceled. All but one student replied via email that they got the notice of cancellation. This is a good example of why PAS asks for your RSVP to attend most every event we provide. You never know when something unexpected is going to happen and the

event will need to be canceled.

I wish to thank the eleven students and eight teachers for monitoring their email and phone texts so that I could quickly get the cancellation notice to them, as I didn't discover the situation until about 5pm. As a rule of thumb, if weather was going to cancel the event, the notice would have gone out by email and/or however you provided your RSVP to me, by 3pm at the latest, but this wasn't an issue with weather.

On behalf of PAS, I apologize and hope everyone will reschedule for the March 9th Telescope Workshop. Thank you for your patience and understanding.

THE STAR BARN - A LOCAL FREE PLANETARIUM

Ron Walker thestarbarn@gmail.com

By Terri, Event Manager

What is a planetarium? A Planetarium is a dome-shaped building, a theater in which images of stars, planets, and constellations are projected on the inner surface of a dome for public entertainment and education. Inside a planetarium, the Planetarium Director (Ron, who is also the owner, builder, and creator of his shows) can create almost any celestial event desired to educate those who attend. These simulations can be for future, present or past celestial events. Here is the difference between these two terms many people confuse. A planetarium is a 'sky theater' where special projectors create a simulation of the night sky on a domed ceiling. An observatory is a place where telescopes are used to view the actual night sky, so the dome of an observatory does open, unlike the one in a planetarium.

The Star Barn: You may not know this, but one of our PAS members opens up his very own – he built it – planetarium for PAS members to attend, learn, and enjoy. This is also open to the public. To attend, you must RSVP directly with Ron (Email address above) by the day before, to attend these Planetarium shows. RSVP is required as seating is limited to about 21 persons. And the doors close right at the start of the event, so do not be late. And the most important news about these FREE planetarium shows is that there are NO BATHROOM FACILITIES and most shows run 90 minutes to 1 hour. Plan accordingly when attending these shows.

Since Ron does this for Free, it is highly important that if you reserve seats for a show, and you let him know if your plans have changed and you can no longer wish to attend on the date and time you have reserved. It is no fun setting up for a show when no one shows up to see it. It's a lot of prep work: warming up the equipment and or the dome, or cooling it down in the summertime. So, be courteous and let Ron know if you need to cancel your attendance once you make a reservation for your party to attend.

Ron Writes: If you are interested in receiving info once a month with the upcoming shows listed, please sign up for his email list. Contact Ron directly to get on and off that list. Also note that shows usually fill up fast so if you are thinking of attending one or more shows, make your reservations right away. All shows last 90 minutes to two hours. Please plan accordingly.

I ask that everyone RSVP with time and date and number of seats requested so I don't overbook and have to turn people away, which has happened, but more often to save me the prep time if no one is interested in a program. Because this list has grown so large (over 700) some servers treat it as spam, so if you do not get the updates by the beginning of the month, after you sign up to receive the email notices, just check your spam folder and see if it is there.

Please also remember that "The Star Barn" is a "primitive" location without bathroom facilities. Please plan accordingly.

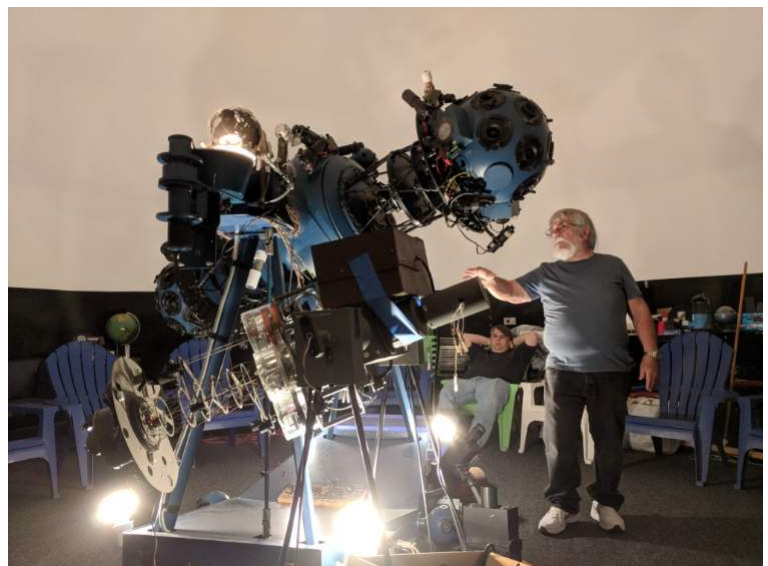
There is no charge for the shows, there is a "donation jar" for those so inclined. Also, everyone must sit through a 42 second "hard sell" for items in the "gift shop". If you need directions just tell me approximately where you are starting

from and I will send detailed ones. If you signed up and no longer wish to receive these updates, just return an email with "delete" in the subject line and you will be banished forever. Also if you reserve seats for a show and can't make it, please cancel at least by the day before and if you want seats please also decide at least by the day before. It is no fun setting up for a show and then having no one come. On the days of shows I spend time in the dome doing set up prep so often don't have time to check for last minute requests. Please be on time as opening the door after everyone is dark adapted is really hard on the eyes. Once a show starts, no one will be admitted. Follow the red arrows for parking.

I do hope you enjoy the program and if you like it, come to others, and/or invite family and friends to future shows. Email me at above address to get on the once a month email list of the upcoming show dates and times.



THIS DOME HOUSES BOB, THE PLANETARIUM PROJECTOR. IT SEATS ABOUT 21 PERSONS FOR SOME SUPER AMAZING PLANETARIUM SHOWS PRODUCED AND PROVIDED BY PAS MEMBER RON WALKER. PHOTO WAS TAKEN BY TERRI IN MARCH 2018.



THE PLANETARIUM PROJECTOR IS NAMED BOB. BOB TAKES THE AUDIENCE ON MANY STELLAR TRIPS THROUGH SPACE AND TIME. RON IS THE OWNER / OPERATOR OF THE PLANETARIUM AND IS SEEN TO THE RIGHT OF BOB. PHOTO WAS TAKEN BY TERRI FINCH IN MARCH 2018.

THE PAS GALACTIC GAVEL

By Terri Finch, Event Manager

The story behind the Galactic Gavel was published in the February 2023 PAS newsletter, starting on page 10. It is a very informative article provided to PAS by Dan Heim (see photo of Dan), with a final paragraph by me. If you haven't enjoyed the story of the Galactic Gavel, you may want to pop into last month's issue and read it before this article, which is the follow-up and conclusion of the story describing the passing of the Galactic Gavel to the current PAS president, and to be handed down to each new President as they take over. As Paul Harvey would say "And now you know the rest of the story."

A quick review before we get to the part you want to hear. On December 10th, 2022, William Finch and I drove up to Dan's awesome home in New River, Arizona. It was a nice drive, and we had a great visit reminiscing with Dan. It wasn't a long visit, but it was enjoyable.

Dan Heim used to be the Facilities Director for PAS. He worked at Brophy College Prep and provided his Science Lab / Room as the meeting location for many years for PAS. When he left Brophy,

he found PAS other meeting locations to use, for free. Then, he decided to start his own club in New River for those who live up there and did not wish to commute down to Phoenix for the PAS meetings.

At the February 2nd PAS meeting, Dan Heim was on Zoom while I passed the Galactic Gavel to President Stu Brackney. Dan explained how the Galactic Gavel came about and why he decided to pass it along to PAS.

Many thanks go to Dan Heim for not only making this exceptional piece of artwork and useful tool, but also for donating it to PAS!

A Gift from the Heavens: PAS Receives A Galactic Gavel

By: Stuart Brackney, President, PAS

Prior to the PAS monthly lecture on February 2nd a former member of PAS presented a gift to our organization. Dan Heim has years of experience as a former member of PAS serving as the facilities manager. He departed PAS for darker skies to the north, and even started his own astronomy club. While at his new club he helped build a gavel but not just any old gavel. This one is made of a beautiful piece of meteorite, attached to a metal handle.

His astronomy club has recently closed, so this fine gentleman wanted to make sure that the gavel had a new home, and now it does as he presented it to PAS at the February 2nd meeting. Terri Finch (PAS Event

Manager) is seen in the attached photo presenting the gavel to Stu.

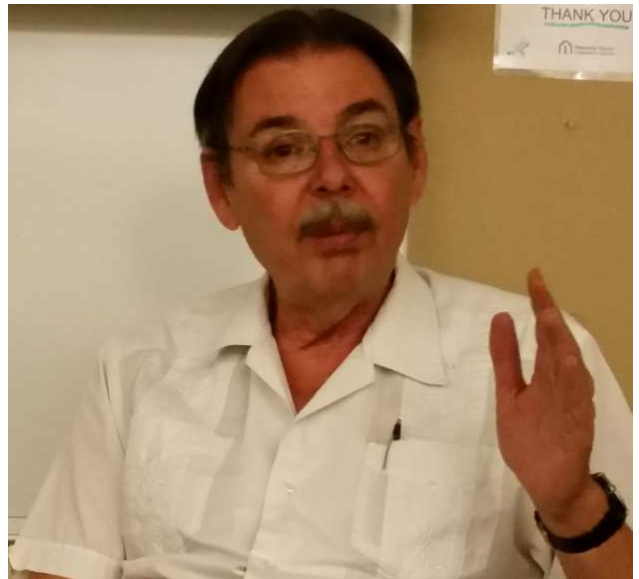
Dan, rest assured, this Galactic Gavel has a fine home now. We even purchased an elaborate carry case for it, soon to have a bronze plate attached to the lid commemorating this gift from you. Your "Gift From the Heavens" is truly appreciated.



THE GALACTIC GAVEL SHALL BE USED AT ALL PAS GENERAL MEETINGS. THANK YOU DAN HEIM FOR THIS GENEROUS DONATION TO PAS. PHOTO BY WILLIAM.



AT THE FEBRUARY PAS MEETING, TERRI FINCH PASSED THE GALACTIC GAVEL TO CURRENT PRESIDENT STU BRACKNEY. PHOTO TAKEN BY WILLIAM FINCH.



DAN HEIM, THE CREATOR AND DONATOR OF THE GALACTIC GAVEL TO PAS. PHOTO BY TERRI FINCH MAY 2015.



AT DAN HEIM'S HOME IN NEW RIVER, THE GALACTIC GAVEL WAS PASSED FROM DAN TO TERRI. PHOTO BY WILLIAM.



SPOT THE KING OF PLANETS: OBSERVE JUPITER

By David Prosper

Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its awesome size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together they would still only be half as massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud

tops with such violence that the fireballs and dark impact spots were not only seen by NASA's orbiting Galileo probe, but also observers back on Earth!

Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million km)! While the King of Planets has a coterie of around 75 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Callisto – can be easily observed by Earth-based observers with very modest equipment. These are called, appropriately enough, the Galilean moons. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but sometimes they can pass behind or in front

of Jupiter, or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening – and night to night – can be a rewarding project! You can download an activity guide from the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

NASA's Juno mission currently orbits Jupiter, one of just nine spacecraft to have visited this awesome world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. In 2024 NASA will launch the Europa Clipper mission to study this world and its potential to host life inside its deep subsurface oceans in much more detail. Find the latest discoveries from Juno and NASA's missions at nasa.gov.



THIS STUNNING IMAGE OF JUPITER'S CLOUD TOPS WAS TAKEN BY NASA'S JUNO MISSION AND PROCESSED BY KEVIN M. GILL. YOU TOO CAN CREATE AMAZING IMAGES LIKE THIS, ALL WITH PUBLICLY AVAILABLE DATA FROM JUNO. GO TO MISSIONJUNO.SWRI.EDU/JUNOCAM TO BEGIN YOUR IMAGE PROCESSION JOURNEY – AND GET CREATIVE! FULL IMAGE CREDIT: NASA/JPL-CALTECH/SWRI/MSSS; PROCESSING: KEVIN M. GILL, LICENSE: CC BY 2.0 <https://creativecommons.org/licenses/by/2.0/> SOURCE: <https://apod.nasa.gov/apod/ap201123.html>

"EXPLORING THE MYSTERIES OF THE UNIVERSE: A JOURNEY THROUGH ASTRONOMY"

by ChatGPT

As members of PAS, we have a shared passion for exploring the wonders of the cosmos. From the distant stars and galaxies to the mysterious black holes and pulsars, the universe holds endless secrets waiting to be uncovered. In recent years, advancements in technology have allowed us to peer deeper into the cosmos and uncover new mysteries. The launch of the James Webb Space Telescope in 2021 promises to revolutionize our understanding of the universe, with its powerful infrared capabilities allowing us to study distant galaxies and stars in unprecedented detail.

Astronomy is not only about studying the objects in the sky, but it also provides

us with a unique perspective on our place in the universe. It helps us understand the origins of our solar system, the evolution of galaxies, and the nature of time and space. As amateur astronomers, we have a crucial role to play in advancing the field of astronomy. By observing the night sky and recording our observations, we can contribute to a better understanding of the universe. Whether it's through observing meteor showers, mapping the Moon, or tracking the movement of planets, there is always something new and exciting to discover.

In addition to the scientific benefits, astronomy also has a profound impact on our cultural and philosophical understanding of the world. It inspires

awe and wonder in people of all ages and encourages us to look beyond our immediate surroundings and contemplate the vastness of the universe.

So, let us continue our journey through the universe, exploring its mysteries and making new discoveries. The universe is a vast and fascinating place, and there is always something new to learn and discover. If you're interested in getting more involved in Phoenix Astronomical Society activities, please check our upcoming events at www.pasaz.org in the Online Calendar and join us for our next meeting or Public Star Party. Together, let us keep reaching for the stars.

JAN 28TH PUBLIC STAR PARTY

By Terri Finch, Event Manager

PAS's Meteorite Man, Mike Marron, provided a wonderful Public Star Party on Jan 28th at his home in Carefree. Many people attended and had a great time. Thank you Mike for offering this public event. Here are a few comments from those who attended.

By Stu Brackney, PAS President

Mike, thanks so much for hosting both of the events (this Saturday and last) at your home. It is truly appreciated by all who attended.

By Carla Meeske

Thanks Terri - it was fun, and I did see the comet!



ORION NEBULA
PHOTO BY MASON
KLENKLEN. ORION
NEBULA SINGLE
EXPOSURE WITH
CELLPHONE CAMERA...
AND 11" SCT.
CAMERA: SAMSUNG
GALAXY NOTE 10,
F2.4, 4.3MM, 30
SECONDS, 800 ISO
TELESCOPE: CPC1100
F/10 WITH GSO
SUPERVIEW 42MM
CAMERA PROJECTION
LENS LOCATION: JUST
SOUTHEAST OF SADDLE
MOUNTAIN, FEB 18TH
2023

PLACE YOUR ASTRONOMY EQUIPMENT AD IN THIS NEWSLETTER

Do you have some astronomy-related items you'd like to sell? Prepare an ad and send it my way so that Don and I can help you sell it through the club newsletter. Items you may wish to sell can include Books, Star Charts, Telescopes, Eyepieces, Finder Scopes, and more. As long as it is astronomy-related, I will happily add it to the newsletter. Please include all items you wish to sell, and what is included with those items. Price them, and provide contact info for the way you wish to be notified, such as email or phone number. I await your submissions. Send them to Editor@pasaz.org.

Ads for items for sale listed in PAStimes Newsletter are written by the seller. PAS is not responsible for the ads and does not guarantee the quality of the items for sale. PAS reminds everyone, you purchase at your own risk, so do your

research beforehand.

Ads in PAStimes run for one month and may be renewed on a month-to-month basis, space permitting, as long as the request to run the ad again is submitted by deadline (10th of month). Ads in PAStimes are FREE for PAS members. Non-members are asked to make a small donation to PAS. Non-members may email Terri, Assistant Editor at Starstuff@gmail.com to place their ad and get details on where to send a donation, via check or money order, made out to Phoenix Astronomical Society. Donations can also be sent via Paypal, Credit Card, or Debit Card.

The deadline for the next issue is the 10th of the prior month. These items and more can also be seen with photos on the PASaz.org website here: www.pasaz.org/items-for-sale

\$1650 for all (brand new on amazon for all is \$1930) Celestron NexStar 8SE Telescope, Like new, only used once (bought in 2021) and now boxed up, Accessories: Celestron - PowerTank Lithium Telescope Battery - Rechargeable Portable 12V Power Supply for Computerized Telescopes -10 hour capacity/86 Wh - Red/Wh, Celestron - 1.25" Eyepiece and Filter Accessory Kit - 14 Piece Telescope Accessory Set - Plossl Telescope Eyepiece - Barlow Lens - Colored Filters - Moon Filter - Sturdy Metal Carry Case. Contact Jaya at Jhbrower81@gmail.com or (201)205-4988. Pick up location around Northsight Blvd & 87th St.

Editor's Note: This will be the last "Telescope for Sale" ad in PAStimes.

STORY TIME

MESSY AND MESSIER



by Alex Vrenios, PhD, PAS Lifetime Member

It was absolutely the best of times: military service was behind me, I finished a bachelor's degree in a burgeoning field, and I was pulling down a pretty good salary. That was about the time I first heard the name Charles Messier.

Messier was born in France, in the early 1700s. He seemed driven by the need for immortality, believing that such a state could be achieved if he discovered a new periodic comet. It would be named after him, and every time it came back around again, the scientific world would speak his name. (You're not really dead until nobody remembers who you were!)

Night after clear night he would search the skies, looking for an elusive, fuzzy object that changed its position against the background stars over time. That's the key: be the first to describe the object and its position in the sky over a couple of nights and publish your results.

Obsessive, for sure, but obsessive doesn't begin to describe his anger at the existence of nebulous, comet-like objects that did NOT move against the background stars! Pesky little objects, indeed.

What they were didn't matter. He owed it to future "comet hunters" (what he fancied himself to be) to catalog these interlopers separately, so they wouldn't fool anyone else.

That settled it – he began what later

became known as the Messier Catalog, or Messier Objects, each labeled M1, M2, and so on. Little did he know at the time that these "pesky little objects" were a lot more interesting than comets ever could be...

Meanwhile, back in the recent past, I started noticing articles in astronomy magazines about the Messier Objects. Over the years, observing its objects had become a rite of passage, so to speak, of novice amateur astronomers becoming recognized at the intermediate level. And there was an added benefit from having located, observed, and logged all of the objects in Messier's Catalog,

they represented a survey of the kinds of objects that can be seen in the night skies – an excellent introduction to observing deep sky objects, something intermediate astronomical observers do.

The purchase price of a new telescope seemed high, and more of a commitment than I was willing to make at the time. I decided to buy a "good pair of astronomical binoculars" which, according to one astronomy magazine columnist, had at least 50mm objective (front) lenses, and independently adjustable eyepieces. I began the hunt.

When I was stationed overseas, I took the \$150 I had saved to the Base Exchange to buy a Minolta SR101T. At the time, a very popular 35mm single lens reflex camera. As I waited by the counter, I noticed a Nikon F body and lens for \$250. The salesman was happy to hold this rarely seen gem for me until

next month. I paid off the balance and added several other Nikkor lenses to it by the time I was back stateside. I never regretted that purchase, and to this day have a very high regard for the brand.

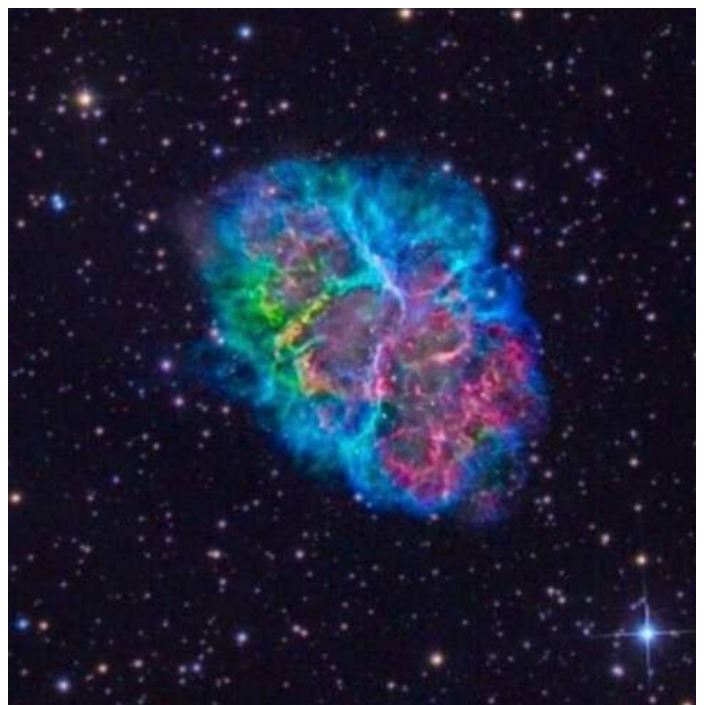
Nikon offered 7x50 Prostar binoculars that filled all my needs. It was not cheap, but I was embarking on a quest, and only the best equipment would do. What kind of a quest, you ask?

I decided to view, describe and catalog every object on the Messier List. Beginning with M1, of course. (Was that a snicker? There's no snickering in astronomy!)

M1, the Crab Nebula, was easy to find on a star chart, and relatively easy to find by using a "star hopping" technique described in Astronomy magazine, which I now subscribed to, and read cover-to-cover every month. I had trouble seeing it, so I got a tripod attachment and set it all up in my backyard. Still no M1 – maybe the skies aren't dark enough here. The northwest suburbs may still be too close to Chicago's city lights.

The following weekend I packed up my chart, tripod, and binoculars and drove to Fox Lake, near the Illinois-Wisconsin border, where it is really dark. And cold, as it happens. It was so cold that I was

See MESSY AND MESSIER in Middle of page 12.



THE ELUSIVE CRAB NEBULA. PHOTO BY NASA.

CAREFREE STAR PARTY JAN 21ST

By Terri, Event Manager

Prior to the Members Only Star Party with Potluck that started about 5pm, there was a wonderful Planetarium Show in Cave Creek put on by Ron Walker at the Star Barn. Ron's shows are informative, entertaining and tailored to his attendees. I had asked Ron to show me where the Green Comet was, while I was in the planetarium, and he did just that plus more! Thank you Ron, for a great show. William and I were the only PAS Members to attend the planetarium show this afternoon. Another couple attended but they were not PAS Members.

Then, after the Planetarium show which ran overtime to about 4:30pm, William and I took off quickly to go pick up four large pizzas from Barro's Pizza and get to Mike's a little after 5pm.

What a glorious star party was had by sixteen PAS Member attendees on January 21st in Carefree. Mike opened up his home to so many wonderful PAS Members. And they had to brave the cold and windchill.

In attendance was Joe Sandy, who is currently the PAS Membership Manager, William and Terri Finch (Event Manager), Dennis Young who is the President of his club in Sedona - Serius Lookers, Todd McNamera, Roger Anzini, Mark Lewanski plus his two sons, Richard Sauerbrun (PAS Treasurer), Calvin Vance, Mel Swan, Richard Pipkin, Paul Facuna (PAS Vice President), Don Boyd (PAS Newsletter Editor), and Frank Insana.

I wish to thank everyone who attended and brought food for the potluck. I saw rotisserie chicken, more pizza than what William and I had brought, a mixed fruit salad, two lasagnas, some side dishes and more.

I also wish to thank so VERY much,

the folks who brought telescopes to share the night sky with the rest of the attendees. We had Joe Sandy with his newer 6", Mark Lewanski had his 12" SCT, Richard S. brought his EAA set up, Calvin V. brought his 6" dob, and Dennis Young had brought his 28" dob, his military grade binoculars and another box looking binocular set up and he ran all three scopes during the evening.

Some great objects were viewed. Horsehead Nebula through Dennis's Night Vision binocular viewers, Orion Nebula, some galaxies, and more nebulae. It was a rare treat for everyone to view so many objects during the evening at this event. Most of the attendees were not prepared for such cold temperatures, a chilly 47 degrees. The group started to go home around 10pm. 11pm was when the Green Comet should have been visible. It took a while for it to get up above the horizon, but Dennis, myself, and Mark were still going at it, although we were freezing, waiting for the Comet to come up and be visible. Finally, it peeked over the horizon and we were able to view it about 12:30am. That's when all the telescopes that braved the cold temperatures to this point, packed up and departed. Inside, Frank, Mike, William and I chatted for about an hour before we departed. It was a very exciting evening.

Many thanks to Dennis for making the trek down to Mike's place from Sedona. I saw things through his scope I haven't seen in ages.

Next week is the next event at Mike's. It's a public star party. It will be colder next weekend than it was this weekend.

By Richard Pipkin, PAS Member

The most obvious thing I noticed when I arrived at Mike's was a gigantic metal contraption that, judging from the enormous mirror at one end and an

eyepiece at the other, was a Dobsonian telescope the likes of which I'd never seen before. It wasn't the largest Dob I'd ever been around, but surely the first all-metal, one-arm version I'd seen. Even the finderscope, a good-sized reflector, would make a useful addition to most of our telescope collections. And as the evening progressed, this gargantuan apparatus presented stunning views of Saturn, Jupiter, and many deep sky objects. This was Dennis Young's 28" Dobsonian Telescope with Night Vision Binoculars.

Of much interest to me was Richard Sauerbrun's WO Redcat 51. Richard's scope was equipped with a ZWO cooled camera (set at minus 10 degrees Celsius), a guide scope with camera, a ZWO ASI Air computer, and a fine example of the neatest cabling I've ever seen. Richard demonstrated how he polar aligned the scope using software on an iPad and how he used the software's GoTo capability to find objects in the sky. Soon we were treated to an on-screen view of M42, the Orion Nebula, the sight becoming more and more spectacular as the software began to stack the images.

Other scopes of interest included Mark Lewanski's 11-inch Celestron which, along with his enviable collection of Nagler eyepieces, produced excellent views of the Pleiades and many other Messier and NGC objects.

Also on display was Joe Sandy's 4-inch Dob on his home-built table that demonstrated how useful and versatile small Dobsonians can be.

The evening was chilly but the sky was mostly clear and we began to break up shortly after ten. The Big Dipper had risen, the entire Winter Hexagon stood high to the Southeast, and a memorable night of stargazing with good friends drew all too soon to a close.

NOMINATION BY EMAIL

On Feb 27, 2023, all active members of PAS will be receiving an online nomination form via email. This nomination form will provide all PAS members the opportunity to nominate individuals for Board officer and director positions for next year.

Some of our current officers and directors wish to be considered for the next year, but all members may add additional candidates. Members who are interested in serving as an officer or director may nominate themselves.



ORION NEBULA PHOTO BY
NEW PAS MEMBER
MASON KLENKLEN.
MASON WRITES: HERE IS A
SHARPCAP LIVE STACK OF
TEN 15 SECOND
EXPOSURES ON MY
CPC1100 F/10 TELESCOPE
WITH HYPERSTAR AND
ZWO ASI017MC PRO AT
11C, 100 GAIN BECAUSE I
DON'T KNOW WHAT I'M
DOING... YET.

VILLA DE PAZ SCHOOL JAN 27

By Terri, Event Manager

This 5th Grade Teacher really knows how to set up a star party! Matthew Airing chose a wonderful dark location on the school grounds in the parking lot where he was able to get maintenance to turn off the lights and make it dark for viewing. On Jan 27th, we had a four planet line-up, the Moon, and the Green Comet to show.

In attendance was Ted Blank with his 12" Dob, Bruce Wurst with his 12" SCT, Storm Moon with Jake Von Ruhr with her 8" SCT, and Terri Finch with an 8" SCT. Mike Marron attended with his Meteorite Collection. We were set up at the east side of the Campus in the north parking lot. As a group we showed Orion Nebula, Mars, the Moon, Jupiter, and Venus. We missed Saturn as it was setting by the time the event began. Many thanks goes to

Matthew for having PAS at his event. There was one other teacher there, the principal, and two maintenance personnel. It was a fabulous event!

Bruce writes: The items that I was able to show were M31, M42, M103, Jupiter, Venus, Mars, and the Moon.

TED BLANK PROVIDES THIS FANSTATIC IMAGE OF THE MOON TAKEN THROUGH HIS 10" DOB WITH AN IPHONE 13, USING A 24MM EYEPiece IN PORTRAIT MODE AND HAND-HELD. TED WRITES: I SENT ABOUT 25 KIDS HOME WITH PICS ON THEIR PHONES TOO. THAT WAS FUN.



DESERT HARBOR SCHOOL JAN 25

By Sarah Tekulve, Awesome Teacher at Desert Harbor

I want to say THANK YOU! Last night's event had this campus buzzing this morning! They were blown away with the event and honestly we can't do these types of events without organizations and

outreach opportunities like the ones you provided to our students and their families. I would love to say I had the number of participants to report to you, but I don't. I just know you reach a lot! More than we had hoped for and you gave them your all and, like I said, everyone

was amazed! So, from the bottom of my heart, thank you! Please be on the lookout because I will be emailing you a request to return next year! Not sure how I can top it, but I spoke with a few of you about some new ideas!

Continued from page 10.

concerned about touching my bare skin to the metal tripod. I leaned against a tree for a steady hold, focused as carefully as I could, and stared hard at where I knew M1 to be located. Still not there. I even did a small spiral search, just in case I was a little off in my estimate of its position. No help.

The long drive home was a painful exercise in self-assessment. I could accept failure maybe halfway through the list, but not on the very first one! I needed a consult.

I knew an avid astronomer who was

MESSY AND MESSIER

also a member of my local camera club. When I told him about my experience he took a half step back, confiding in me that the first time he saw the M1 Crab Nebula was through a friend's 10" Newtonian telescope!

It is important that one learns a lesson from failure, lest he or she become afraid to try anything new. I learned a new word: chagrin. I also learned an important property of a night sky object: magnitude. If I ordered Messier's list of objects by how bright they appear to be, maybe I can make some progress by starting with the brightest ones first – worth a try, I thought.

Fast forward twenty-five years to when I finally gave it another try. The Astronomical League's Binocular Messier award program requires one to observe and log fifty of the 110 objects from the Messier Catalog. Of course, I would do it using the same binoculars, but M1 would not be among them. It took me a while to get all fifty, some while I sat bundled up against the cold, but I did find and catalog them all.

"Finally!" I said, as I pushed that hard-earned award pin into the cork board on my office wall.

MESSIER MARATHON

By Terri Finch, Event Manager

The Messier Marathon, which is one night in March every year when astronomers strive to see all 110 Messier Objects from Dusk to Dawn, and with NO Moon in the night sky, for 2023 is happening 2 weekends this year. This is due to the new Moon falling on a Tuesday and so the Weekend before the New Moon and the weekend after the New Moon are very choice dates for this year's Marathon. Those 2 weekends are March 17 and 24, 2023. Lowell Observatory is hosting an all night virtual star party to see all 110 objects on the night of Mar 18 into the morning hours of Mar 19th this year. Go to Lowell's site for more details. At the time this newsletter is being put together, PAS does not have plans for a Club Messier Marathon but instead for PAS Members, there is a Night Sky Training Session on Mar 18th.



SPOT THE MORNING AND EVENING STAR: OBSERVE VENUS

David Prosper

Venus is usually the brightest planet in our skies, and is called “Earth’s Twin” due to its similar size to Earth and its rocky composition. However, Venus is a nightmare version of our planet, featuring a thick, crushing atmosphere of acidic clouds, greenhouse gasses, howling winds, and intense heat at its surface.

This rocky inner world’s orbit brings it closer to Earth than any of the other planets, and is the second closest to the Sun after Mercury. Like Mercury, Venus orbits between our planet and the Sun, so Earth-based observers can observe Venus in the morning before sunrise, or in the evening after sunset – but never high in the sky in the middle of the evening, unlike the outer planets. Since Venus is so striking in its twilight appearances, the planet features heavily in sky mythologies worldwide. Venus’s bright morning and evening appearances are the origin for its dual nicknames: the Morning Star, and the Evening Star. Some ancient astronomers never made the connection, and assumed the Evening Star and Morning Star were two unrelated objects! Observers can even spot Venus during the daytime, if the sky is very clear and the planet is bright enough. Venus also has phases, similar to the Moon and Mercury. Galileo’s observations of Venus’s phases helped turn the astronomy world upside down in the early 1600s, and you can see them

yourself using a telescope or even a surprisingly low-power pair of binoculars. Warning: Please be very careful when observing Venus with a telescope in the early morning or daytime. Never allow the Sun to enter your instrument’s field of view, as you could be permanently blinded.

Venus’s other moniker of “Earth’s Twin” is a bit misleading. In terms of their surface temperatures and atmospheres, Venus and Earth are extremely different! The surface of Venus is warmer than that of Mercury, despite Mercury being many millions of miles closer to the Sun. While Mercury is still a scorching 800 degrees Fahrenheit (427 degrees Celsius), Venus is even hotter: 900 degrees Fahrenheit (482 degrees Celsius). The vast amount of carbon dioxide in the thick Venusian atmosphere acts as an insulating blanket that retains much of the Sun’s heat, creating the runaway greenhouse effect that dominates its present-day climate. The Venusian surface is a crushing 90 Earth atmospheres on top of its absurd temperatures. These extreme conditions mean that the mission life of any past Venusian robotic landers were measured in hours at best – and usually minutes! However, conditions in Venus’s upper atmosphere may be much more hospitable, with temperatures and pressures at 30 miles (50 km) above the surface that are much more Earth-like in

temperature and pressure. Studies of the Venusian atmosphere, including seasonal appearances of dark streaks and faint signals of suggestive chemistry, intrigue researchers with the possibility that some sort of life may persist in its clouds. But far more evidence is needed to confirm such a claim, since non-biological factors like volcanism and other processes could also be the source for these signals.

Venus’s thick sulfuric acid clouds block direct visual observations of its surface from optical telescopes on Earth. Multiwavelength observations from space probes show evidence of active volcanoes and possibly some sort of plate tectonics, but followup missions will be needed to confirm the presence of active volcanism, plate tectonics, and any possible signs of life. In order to do so, NASA is sending two new missions to Venus by the end of this decade: the orbiter VERITAS, which will map the surface in high detail and study the chemistry of its rocks and volcanoes, and DAVINCI+, which will study its atmosphere and possible tectonic surface features via a “descent sphere” that will plunge into Venus’s clouds. Follow their development and discover more about Venus at solarsystem.nasa.gov/venus, and of course, continue your exploration of the universe at nasa.gov.



THE TOP LAYERS OF VENUS’S CLOUD POP IN THIS CONTRAST-ENHANCED IMAGE, REPROCESSED WITH MODERN TECHNIQUES FROM MARINER 10 DATA. CREDIT: NASA/JPL-CALTECH
SOURCE: <https://solarsystem.nasa.gov/resources/2524/newly-processed-views-of-venus-from-marin-1>

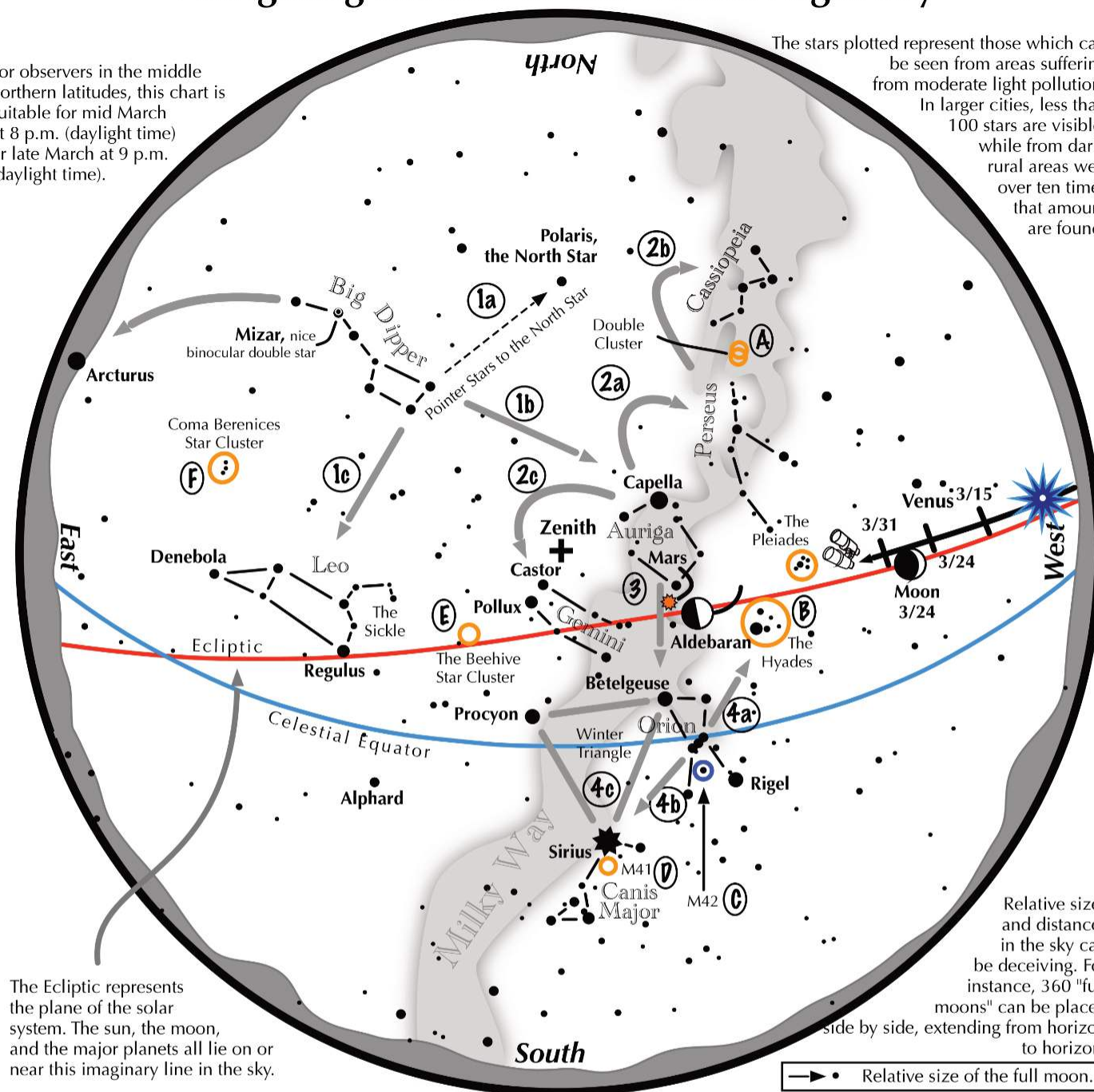


VENUS AND JUPITER CONTINUE TO MOVE CLOSER TOGETHER IN THE EVENING SKY THIS MONTH. JUPITER WILL CONTINUE ITS DESCENT TOWARDS THE HORIZON WHILE VENUS WILL CONTINUE TO CLIMB AND WILL BE VISIBLE IN THE EVENINGS THROUGH MID-SUMMER OF 2023. IT’S A GREAT YEAR FOR VENUS FANS! Image created with assistance from Stellarium

Navigating the mid to late March Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid March at 8 p.m. (daylight time) or late March at 9 p.m. (daylight time).

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

—●— Relative size of the full moon.

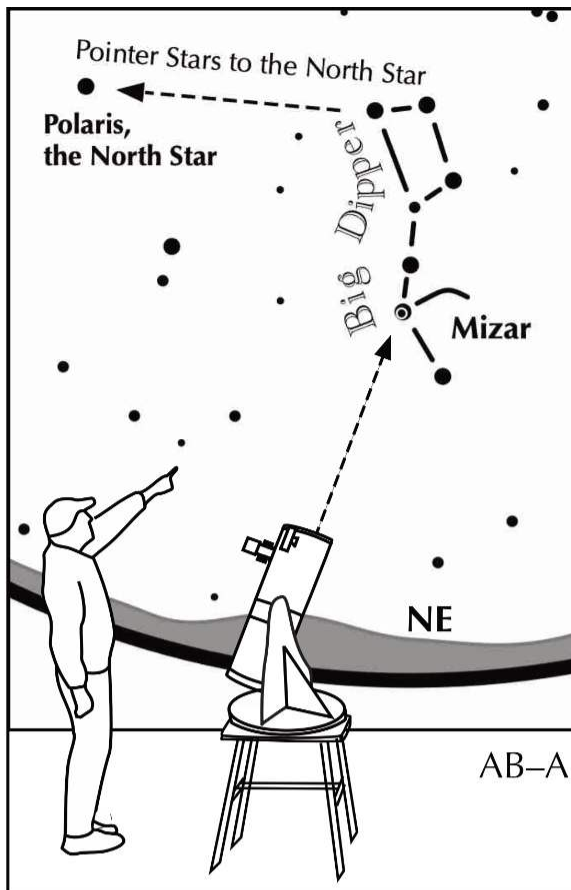
Navigating the March night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star. Its top bowl stars point west to Capella in Auriga, nearly overhead. Leo reclines below the Dipper's bowl.
- 2 From Capella jump northwestward along the Milky Way to Perseus, then to the "W" of Cassiopeia. Next jump southeastward from Capella to the twin stars of Castor and Pollux in Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star Rigel.
- 4 Use Orion's three Belt stars to point northwest to the red star Aldebaran and the Hyades star cluster, then to the Pleiades star cluster. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius. It is a member of the Winter Triangle.

Binocular Highlights

A: Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **C:** M42 in Orion is a star forming nebula. **D:** Look south of Sirius for the star cluster M41. **E:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux. **F:** Look high in the east for the loose star cluster of Coma Berenices.





Other Suns: Mizar



How to find Mizar on a March evening

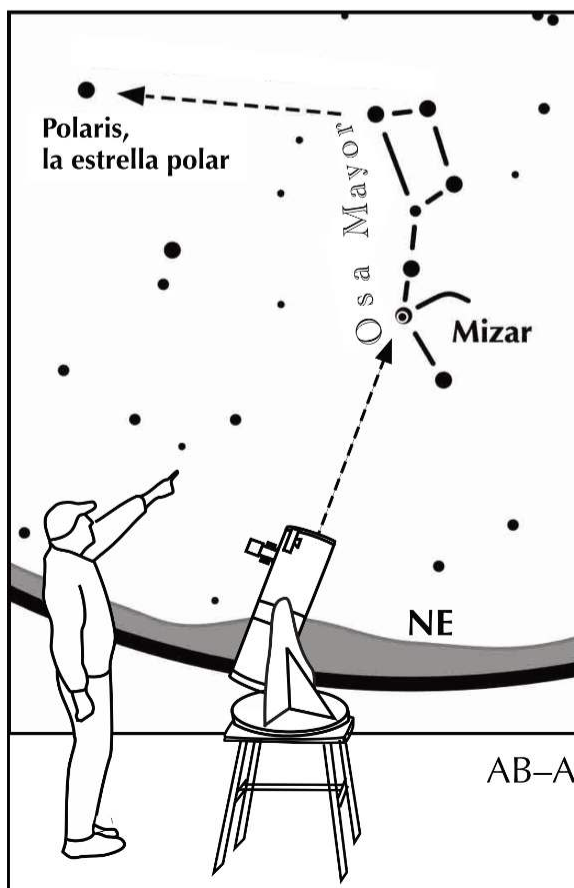
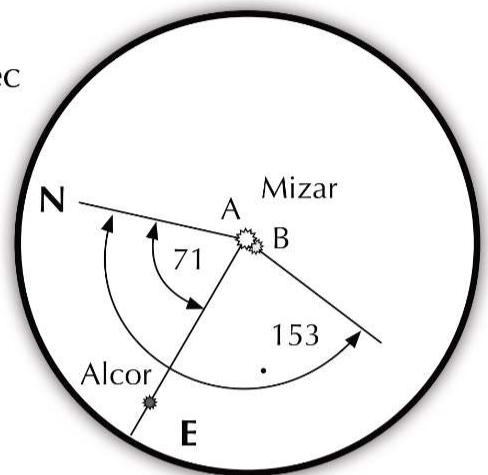
Look northeast toward the Big Dipper. The second star from the end of the Dipper's handle is Mizar. The 4th magnitude Alcor is immediately next to it.

Suggested magnification: >40x
Suggested aperture: >3 inches

Mizar

A-B separation: 14 sec
A magnitude: 2.2
B magnitude: 3.9
Position Angle: 153 °
A color: white
B color: pale green?

AB-Alcor separation: 11 min
Alcor: 4.0
PA: 71°



Otros Soles: Mizar

Cómo encontrar a Mizar en una tarde de marzo



Mire al noreste hacia la Osa Mayor. La segunda estrella desde el final del mango del Dipper es Mizar. Inmediatamente al lado está el Alcor de 4ª magnitud.

Ampliación sugerida: >40x
Apertura sugerida: >75 mm

Mizar

A-B separación: 14 sec
A magnitud: 2.2
B magnitud: 3.9
Ángulo de posición: 153°
A color: blanca
B color: verde pálido

AB-Alcor separación: 11 min
Alcor magnitud: 4.0
PA: 71°

