



PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Patrick Smith to Speak at September 5th Meeting "Backyard Worlds/Planet 9 and Zooniverse"

Patrick Smith writes: I am a computer professional who's lived in Phoenix since the 1990's. For the past few years I've spent some of my rare spare time helping NASA look for Planet 9 and Brown Dwarf objects in images from a space telescope. This effort, involving a research team of scientists and NASA investigators goes by the name 'Backyard Worlds/ Planet 9'. Tonight I will give a brief overview of this project, the nature of the work, the team and its results, so far and invite you to join us in this fascinating and challenging work!

Launched in 2009, deactivated in 2011 after depletion of its onboard liquid hydrogen coolant, the WISE IR telescope was reactivated in 2013 for re-focused collection of IR images at 3.4 and 4.6 micron wavelengths. This collection is still ongoing, working on its 12th complete imaging of the sky. So far it has collected over 12.8 million individual images and over 95

billion source detections.

While automatic computer imaging processing works across this vast collection, it has become apparent that such techniques are unable to identify a substantial portion of the objects found there. In an effort to tap this massive array of data to better understand our Solar neighborhood, a team of researchers from NASA, NOAO, and cooperating institutions (such as UoA, ASU, Stanford and the AMNH) has designed a series of scientific research projects using amateur analysis of specially processed collections of images (referred to here as "flipbooks") to identify potential nearby IR objects on the basis of their Proper Motion (PM).

One of several ongoing NASA sponsored Citizen Science projects, this particular research project, named "Backyard Worlds/Planet 9" has proven one of the

most productive in terms of generated discoveries and scientific publications generated. To quote from a recent communication from Marc Kushner, NASA PI:

"Team, We've been so busy following up your discoveries that we have fallen behind in our blogging. So here's a little update on the project!"

First some numbers. You have submitted 32,810 sources via the Think-You've-Got-One form(s). Adam Schneider has done one pass through this list to confirm these sources, check for objects that have not been previously published, and check for duplicates. We also have a group of superusers separately working their way through this list to look for new solar system planets (e.g. planet nine). We haven't discovered a planet yet, but we are getting familiar with the variety of false positives

See "Sept 5th Meeting" on page 3

May 9 PAS Meeting in Review

By Terri, Event Manager

This month's meeting was a bit scrambled but it worked out well. We had a Meet & Greet Dinner before the meeting at Chili's on 3rd Street and Bell Road in Phoenix at 4:30pm. Seven PAS Members and the Guest of Honor - David Lee Summers - enjoyed food and socializing together. They told me dinner was great and I should have attended.

The meeting was opened by President Mike at 7:30pm. He then turned the floor over to Sam who did a brief announcement about the PAS Scholarship, what it involves, the status of it, etc.

Then Mike took the floor and briefly talked about his upcoming events, before turning the floor over to David Summers, who began his presentation at 7:34pm and ended it at 8:30pm. This was an amazingly informative and wonderful presentation about Kitt Peak and what is going on there with research, the DESI project, etc. David was very good at the interactivity of the group as questions were asked throughout his presentation. Many thanks to David for such a fantastic presentation. Many PAS Members came up to me after the presentation and asked if we can have David return for a future talk.



Author and Astronomer, David Lee Summers gave a wonderful talk on Kitt Peak at the May 9th PAS Meeting. Photo by Terri Finch.

See "May 9th Meeting" on Page 5

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PAS Upcoming Events for September

By Terri Finch, Event Manager
Check out these and other fun events on the PAS Calendar: <http://www.pasaz.org/forums/calendar.php>. RSVP where requested to Events@pasaz.org. On the PAS Calendar, "Private" means the event is for PAS members only. If you wish to become a PAS member and attend the private events, please download a membership form here: <http://www.pasaz.org/forums/downloads.php?do=file&id=129>

Aug 30, Aug 31, Sept 1: PAS will be providing a star party on these three evenings (weather permitting) at the Cokocon Convention at the Doubletree by Metro Center Mall in Phoenix. Please see the PAS

online Calendar for more details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&c=2980&day=2019-9-12&c=1>

Sept 5: PAS Meeting at PVCC Main Campus in LS-203 at 7pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&c=2995&day=2019-9-5&c=1>

Sept 12: FREE Telescope Workshop at PVCC Main Campus 7pm to 9:30pm in G-147. Bring your telescope and accessories. This is an indoor/outdoor event (weather permitting) and RSVP is required with Terri. No public RSVP's could cancel this event. More details are here:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&c=2980&day=2019-9-12&c=1>

Sept 26: Huge Public Star Party at Black Mountain Campus of PVCC from 5:30pm to 9:30pm. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&c=2988&day=2019-9-26>

At the time of completion of this issue of the newsletter, several more events were in the planning stages and could not be listed as "Scheduled" until they are definitely happening. Please see our online calendar for the events that didn't make it into this list: the link is at the top of this article.

Spectacular Guest Speakers at PAS Meetings!

By Terri, Event Manager
PAS has had some fantastic guest speakers in its history of PAS General Meetings at which PAS hosts a Guest Speaker. I wish to thank our current Vice President, Paul Facuna for the most wonderful guest speakers he set up for the last two year's PAS Meetings and now for this next year of PAS Meetings. This data can be found and is updated at this link: <http://www.pasaz.org/index.php?pageid=meetings>

Purchased new in July 2018 with accessories as a bundle. They were used only long enough to align the scope. Package includes: 1. Celestron CPC Deluxe 925 HD Computerized Telescope Original cost \$2,999.00 2. 2-inch color filter set \$19.99 3.

Here are the Guest Speakers you can enjoy in the near future at a PAS Meeting near you.....

Sept 5, 2019: Patrick Smith: Title: "Backyard World/Planet 9 and Zooniverse"

Oct 3, 2019: Klaus Brasch: Title: "The Photographic Legacy of Lowell's Great Refractor"

Nov 7, 2019: Dr. Gerard van Belle Topic: Lowell Telescopes and the Navy Precision Optical Interferometer

Dec 5, 2019: David Williams Topic: Update on NASA Small Body Missions

Feb 6, 2020: Lauren Edgar Topic: Mars Rover Science

May 7, 2020: Vincent Cataldo Topic: Planetary Science

We would love to see you at all these fantastic PAS Meetings!!! Everyone is welcome. Bring a snack to share & Bring a Friend!

Scope for Sale:

2-inch 13% moon filter \$19.99 4. Celestron Wedge HD Pro \$349.00 5. Orion Scope Cloak (cover) \$87.19 6. Celestron car battery adapter \$19.95 7. Celestron WiFi \$100.00 8. ZWO ASI planetary camera \$249.00 Total \$3,842.07 Asking \$2,500.00

for the package. Must be picked up by buyer at residence in Gilbert. Can be dismounted from tripod. Weighs about 100lbs. total. Please call Bob (480) 231-7012 or email at rabidrobot47@yahoo.com

September 5th Meeting

Continued From Page 1

that we need to understand, and there is still at least 2/3 of the sky left to search in this mode.

These submissions boil down to 1,305 objects that are on our follow-up list: mostly brown dwarf candidates. These objects feed what has become a vast follow-up program with telescopes in the north (Keck, Apache Point Observatory, IRTF, Mont Megantic), the south (Magellan, Gemini) and in space (Hubble and Spitzer). Of these candidates, we have confirmed and classified 67 T dwarfs and 60 L dwarfs by taking their spectra and comparing them against spectra of known brown dwarfs, for a total of 127 spectroscopically confirmed brown dwarf discoveries. Congratulations to Vinod Thakur, Peter Jalowiczor, Tadeas Cernohous, Hugo Durantini Luca, Giovanni Colombo, Sam Deen, Andres Stenner, Melina Thevenot, Les Hamlet, Nikolaj Stevnbak Andersen, Sam Goodman, Dan Caselden, Jörg Schümann, Guillaume Colin, Paul Beaulieu, Karl Selg-Mann, Tamara Stajic, Austin Rothermich, Billy Pendrill, Christopher Tanner, Rosa Castro and Bob Fletcher for finding these confirmed brown dwarfs!

The T dwarfs and L dwarfs teach us about brown dwarf demographics and formation processes when they are nearby, and indeed 55 of our brown dwarfs and brown dwarf candidates are within a distance of 20 parsecs from the Sun. This group also contains exotic objects such as

co-movers and color outliers, which tell us about brown dwarf ages, and thereby brown dwarf masses. We are working on writing a paper about a very rare co-mover submitted by Sam Goodman, a pair of brown dwarfs that appear to orbit one another.

We've also been focusing lately on the reddest and coldest, the Y dwarfs. These are the objects that overlap with exoplanets in terms of temperature and mass; only 27 examples are currently in the published literature. We can spot many of our Y dwarf candidates using the WISE images; we consider those with W1–W2 colors (or color limits) greater than 2.7 magnitudes to be Y candidates. So far, roughly 100 of our objects meet this criterion to be considered Y dwarf candidates. Congrats to Guillaume Colin, Sam Goodman, Dan Caselden, Billy Pendrill, Nikolaj Stevnbak Andersen, Les Hamlet, Jörg Schümann, Melina Thevenot, Austin Rothermich, Karl Selg-Mann, and Christopher Tanner for finding Y dwarf candidates...stay tuned!"

As the project moves forward it has grown to include the search for the postulated 'Planet 9', solar neighborhood Brown Dwarf objects, cool and 'dusty' white dwarfs and hyper-velocity M dwarfs. New tools are now available via new catalogs specifically created around this project. Given the massive, and growing, array of data still available, new participants are needed and always welcome and the team

is highly receptive to research ideas and designs from participants. In every case this project makes every effort to individually recognize contributors in scientific publications and other venues.

Here are abbreviated CVs of the PIs and extended Science Team members of our project. I'm not a scientist. I'm a Citizen Scientist participant in the project (as well as a volunteer admin for a NASA facebook group and coordinator for NASA Citizen Science access to the Meet-up platform).

Core Science Team

Jackie Faherty (American Museum of Natural History) is a staff scientist in the department of Astrophysics at the American Museum of Natural History. She received her Ph.D. from Stony Brook University in 2010 with a dissertation entitled "The Brown Dwarf Kinematics Project". Dr. Faherty's research group entitled Brown Dwarfs in New York City (BDNYC) looks at the intersection of the observable properties of brown dwarfs and giant exoplanets. She has a keen interest in the atmospheres of the coldest brown dwarfs and how they resemble those of Jupiter. Follow her on Twitter @jfaherty!

Marc Kuchner (NASA Goddard Space Flight Center) is the Principal Investigator (PI) of Backyard Worlds: Planet 9. Marc got his bachelor's degree from Harvard, his Ph.D. from Caltech, and completed one postdoctoral fellowship at the Harvard-

What's Up For September? September 15, 2019

By Don K. Boyd, PAStimes Editor

Name	Date	Rise	Set
Mercury	09-15-19	07:30	19:45
Venus	09-15-19	04:24	19:36
Mars	09-15-19	06:10	19:13
Jupiter	09-15-19	14:25	22:23
Saturn	09-15-19	16:25	12:25
Uranus	09-15-19	20:25	10:52
Neptune	09-15-19	19:04	06:13
Pluto	09-15-19	16:54	12:57

All Times Arizona Time

Bold means the object is "visible" in the evening

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Sunrise: 6:34

Sunset: 19:15



Q1: September 6



Full: September 14



Q3: September 22



New: September 28

September 5th Meeting

(Continued from page 3)

Smithsonian Center for Astrophysics, and one at Princeton. He has worked on theory, observations and instrumentation, mostly related to extrasolar planets, circumstellar disks, or planet formation. At Caltech, Marc was a graduate student of Mike Brown, who is also now searching for planet nine. Marc is also the PI of Disk Detective, another popular Zooniverse citizen science project, which also uses data from WISE. You can follow him on Twitter @marckuchner

Aaron Meisner (NOAO) is a Hubble Fellow at the National Optical Astronomy Observatory. He went to college at Stanford and earned a Ph.D. from Harvard in 2015. He specializes in processing large data sets of astronomical images. Lately, he's been analyzing millions of WISE images in search of planet 9.

Adam Schneider (Arizona State) Adam Schneider received his Ph.D. from the University of Georgia and is currently a research scientist in the School of Earth and Space Exploration at Arizona State University. He is an observational astronomer whose research focuses on identifying and characterizing late-type stars and brown dwarfs in the Solar neighborhood. He is particularly interested in the nearest systems, as well as young, nearby systems and how such objects can aid in our understanding of the diversity of extrasolar planets as well as the star formation history of the local neighborhood.

Collaborators

Katelyn Allers (Bucknell University) is a professor of Physics and Astronomy at Bucknell University. Katelyn received her Ph.D. in astronomy from the University of Texas at Austin. Her research focuses on

determining the properties of brown dwarfs and extrasolar planets, and she enjoys including undergraduate students in her research. She is best known for developing a widely utilized classification system that determines the temperatures and ages of brown dwarfs from infrared spectroscopy. Dr. Allers is currently designing instrumentation for the exciting next generation of extrasolar planet searches. Follow her on Twitter: @katelynallers

Daniella C. Bardalez Gagliuffi is a Kalbfleisch Fellow at the American Museum of Natural History. Originally from Lima, Peru, she obtained her BS from MIT and Ph.D. from UC San Diego. Dr. Bardalez Gagliuffi is an observational astronomer with extensive experience with near-infrared spectroscopy. Daniella's research focuses on the identification and characterization of binary systems of brown dwarfs, and she is interested in finding planetary-mass companions to brown dwarfs to test formation theories. Follow her on Twitter @astro_daniella!

Adam Burgasser is a Professor in the Department of Physics at UC San Diego, and an observational astrophysicist investigating the lowest mass stars, coldest brown dwarfs, and exoplanets. He uses a variety of ground-based and space-based telescopes to research the physical properties and processes of these objects, including optical and near-infrared spectroscopy to explore the atmospheres of MLTY dwarfs; high-resolution laser guide star adaptive optics imaging and high-resolution spectroscopy to search for and characterize low-mass multiple systems; radio, optical and X-ray observations to study magnetic activity; synoptic photometry and spectroscopy to investigate brown dwarf weather; and

numerical simulations to characterize brown dwarf populations. He is best known for leading the definition of the T spectral class (part of his Ph.D. thesis work), discovering metal-poor halo L subdwarfs, and investigating the remarkable L dwarf/T dwarf transition. Follow him on Twitter @browndwarfs!

Jonathan Gagne (Carnegie Institution of Washington, Department of Terrestrial Magnetism) Québécois Jonathan Gagne earned his Ph.D. from the University of Montreal. He's an expert on brown dwarfs, exoplanets and near-infrared spectroscopy. He also works on the Disk Detective citizen science project, helping identify objects that are in young moving groups with his BANYAN Sigma software.

Sarah Logsdon (NASA Goddard Space Flight Center) is a NASA Postdoctoral Program Fellow in the Exoplanets and Stellar Astrophysics Lab at NASA Goddard. She earned her Ph.D. from the University of California, Los Angeles. Her research focuses on the detection and characterization of the coldest brown dwarfs, and she is particularly interested in the overlap between these substellar objects and Jupiter-like exoplanets. Dr. Logsdon is also an instrumentalist who works on the development of optical and near-infrared astronomical instruments for ground, airborne, and space-based observatories.

John Wisniewski (University of Oklahoma) is a Presidential Professor & Associate Professor at OU. He got his bachelor's degree from the University of Wisconsin-Madison and his Ph.D. from the University of Toledo. John is an observational astronomer who studies stellar astrophysics, circumstellar disks, and extrasolar planets.

Phoenician Resort Star Party March 20

By Sam Insana, PAS Member

March 20th, the night of the Equinox and the Super Moon, PAS held a star party for a business group at the Phoenician Resort. Thick clouds were predicted for the entire event, but the organizer insisted we send two telescopes and Mike our Meteorite Man. Stacey, our contact, hoped for a break in the clouds long enough for people to see the moon. We set up on a beautiful lawn where hundreds of people gathered

for a huge bar-b-que. It didn't get dark until about 7:30 pm, and at that time the full moon was just above the buildings to the East. The thick clouds obscured the moon. Sirius and Rigel and Regulus came out for about a minute each and that was it for stars. Finally, at 8:00 pm, the moon started to appear, but was too covered by clouds to see any details. At 8:30 pm Roger and I were able to show the craters Plato and Tycho, and a small crater that was very

shiny. Roger said it may contain some ice. Dozens of guests enjoyed seeing the full moon for about 30 minutes. We also talked about the night sky with Star Tracker on iPads, and talked about our telescopes. Mike was busy all night with his meteorites and dozens of people. At 9:00 pm when the party broke up, the moon was looking its best. Roger and I would have stayed longer but we were asked to leave since the event was over.

(Continued from Page 1)

Since some of the 23 attendees seemed to be eager to depart after David's presentation, Mike and I decided to do the raffles first before the rest of the announcements. So, we had both raffles. The main raffle was won by Calvin who was very surprised he won. The other raffle was for a donated handmade beanie made by David Summers's wife, in dark blue yarn with yellow spiral galaxies on it and donated to PAS by David Summers. William won this raffle. Many tons of thanks to David and his wife Kumie for providing this super item to be raffled off for free.

Then Mike led the Elections of the PAS Officers for Fall 2019 into Spring 2020. Rick and Eric were not in attendance at this meeting. The results of the PAS Elections will be in a separate article in this issue of PAStimes Newsletter.

After the Elections, Mike wanted me to talk about his upcoming events, and mention Roadrunner Park Astronomy Day for May 11th and the weather situation. I also reminded everyone that PAS does not meet for regular Guest Speaker General Meetings during June, July and August as the room we are in is not available during the summer months. I also mentioned that the BMC Star Parties will start back up in September on my birthday (Sept 26) and everyone listening should plan to attend.

Don Boyd did a brief announcement about Earl DeLong's telescope, which is in Don's care, for sale at ½ the purchase price, to a PAS Member. More data on that sale will be provided through email to the Members, or other ways.

I wish to thank everyone for bringing snacks to share and thank you to Bruce Wurst for donating a case of bottled water to the meeting. I wish to also thank Stu Brackney, the PAS Host for signing everyone in at the meeting.

With the closing of the meeting about 9pm, many members stuck around to socialize and talk about various things before everyone departed at 10pm. This was a fun,

May 9th Meeting

informative meeting with a fantastic guest speaker. Looking forward to the September 5th PAS Meeting. The Newsletter and PAS site www.pasaz.org will have the room number. Watch for the announcement. Hope to see you there!veness of the group as questions were asked throughout his presentation. Many thanks to David for such a fantastic presentation. Many PAS Members came up to me after the presentation and asked if we can have David return for a future talk.

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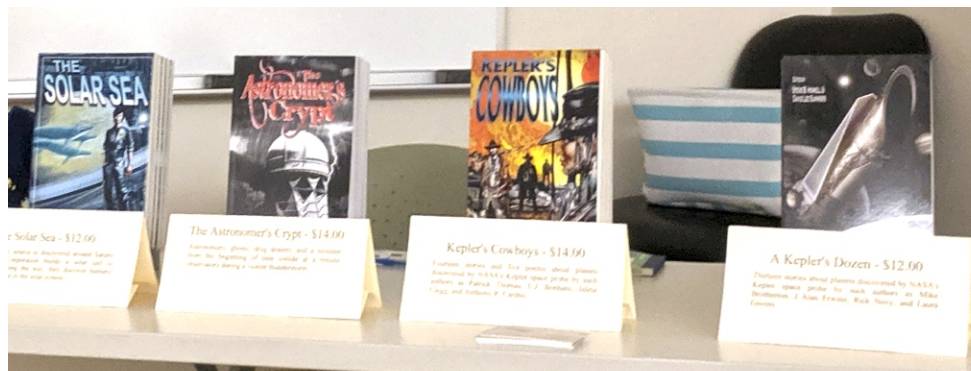
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David Summers also brought his books for a Book Sale and Signing. Many PAS Members picked up books he had available. Photo by Terri.

Meeting of the Minds of June 29

By Terri Finch, Event Manager

Ten members of PAS met at Sesame Inn at 12:30pm to enjoy lunch before the meeting. Sesame Inn was delicious.

Many thanks to Mike for hosting this long but very productive PAS Business Meeting. The meeting opened at 2:32pm with the following attendees: Rick, Paul,

Don, Cheryl, William, Terri, Mike, Mark, Pete, Bob and Eric. Within 10 minutes Storm and Jake arrived. The meeting concluded at 6:05pm. Around 4:20pm Eric had to depart, and about 4:30pm, Mark left. I wish to thank everyone who bought snacks to share: deviled eggs, popsicles, snack protein and granola bars, cookies, donuts,

and drinks. This was a very long but super productive meeting. About 40 topics were discussed, many topics had decisions made, several were put on the table for next meeting. It was an enjoyable meeting. Total attendance for the meeting was 13.

Welcome Back and Officer Election Results

By Terri Finch, Event Manager

Another year of PAS is in the works with a ton of great upcoming events that you will not want to miss. The PAS year of September 2019 to end of May 2020 is underway. I'd like to welcome back everyone to another year of fun, informative, educational, and entertaining events, meetings, and more provided to you from PAS!

At the May 9th PAS Meeting, PAS Elections were held for the Officer Positions of the next year. Officers take over their positions or give up their position as of the September 5th PAS Meeting. Here are the results of the May 9th Election:

- The Current PAS Meeting Host is Stu Brackney who has graciously said he will take this position again for the next year. Congrats to Stu!!!
- The PAS Editor is Don Boyd who as also agreed to take Editorship again for this next year. Thank you Don, the PAStimes Newsletter is awesome because of you!
- The Secretary position was briefly

held by Rick Cunningham who has requested to not be Secretary this next year, but would take it if no one else stepped forward to do it... and so Rick was voted into Secretary for this next year. Thank you Rick for being a super Secretary at the Meetings.

- The Treasurer position changed part way through Spring 2019 from Rick back to Eric Steinberg who had it in Fall 2019 and had to pass it on to someone else due to health issues. The health situation has been resolved and everyone in PAS hopes Eric stays healthy and happy. Even though Eric didn't want the position back, he has the Treasury position for another year. Congratulations Eric. You do a fantastic job of keeping the PAS Treasury organized. Thank you.
- Vice President is currently Paul Falcuna who has agreed to take it again for this coming year. Congratulations Paul. You have been and will continue to be a fantastic VP for PAS!

• And then we come to President Mike Marron. And yes, Mike has agreed to remain as president for one more year. Mike has done very well with his Presidency and I'm glad he is President again this coming year. Congrats Mike!

• Jenny Weitz will continue as Member at Large - thank you Jenny. Bruce Wurst has also agreed to stay as Member at Large - many thanks to Bruce.

• The next position is appointed by the President and has not changed as of the May 9th Elections Night: so I, Terri Finch, will stay as PAS Events Manager. Should I congratulate myself? There was no appointments made or dissolved at the meeting. Appointed positions are usually updated or changed in January each year by the President.

Many thanks to the 23 attendees who were able to make it to this meeting. Hope to see you at the September 5th PAS Meeting to enjoy another great year with PAS!!!

Need Help With Your Telescope?

By Terri, Event Manager

PAS offers FREE Monthly Telescope Workshops. These workshops require an RSVP because if no one needs our help that month with their telescope, we cancel the event.

PAS currently holds these FREE workshops at PVCC Main Campus, 32nd Street and Union Hills in Phoenix, from 7pm to 9:30pm. If no one shows up, or everyone has left by 9pm, the class ends. When you RSVP to Events@pasaz.org, please tell us the Make and Model of the telescope you are bringing that you need help with, the number in your party, as seating is limited,

and provide the Name and Date of the event you will attend, example: Telescope Workshops Sept 12, 2019.

Here are the upcoming 2019 - 2020 Telescope Workshops. More workshops may be added to the calendar, but these are the ones scheduled at the time this newsletter was posted to the PAS Site.

- Sept 12, 2019 7pm to 9:30pm
- Oct 17, 2019 7pm to 9:30pm
- Nov 14, 2019 7pm to 9:30pm
- Dec 12, 2019 7pm to 9:30pm
- Jan 30, 2020 7pm to 9:30pm

Feb 13, 2020 7pm to 9:30pm

Mar 12, 2020 7pm to 9:30pm

Apr 9, 2020 7pm to 9:30pm

Please see online Calendar listing at <http://www.pasaz.org/forums/calendar.php> for more details about each event. We hope you can attend one or more of these workshops. We enjoy helping others learn how to enjoy their telescopes. We also have very qualified Telescope Teachers who can assist in knowing what your telescope needs, if parts are missing, and we can advise on accessories for your telescope. RSVP to attend a Free Workshop today!

Box Tops for Education

By Terri, Event Manager

If you purchase something that comes with a Box Top for Education and you aren't already donating them to a grade school of your choice, I request you drop them off with me so that as PAS does school events, I can give them to the teachers who ask PAS to be at their events. As

of the May 9th Hidden Hills school event, I gave away the last of the collected Box Tops from the past school year. I am now collecting for next school year, September to May. When you see me at any event, you can give me Box Tops for Education collected over the summer, and throughout the upcoming year, and I will get them to

the Schools the Telescope Team provides star parties for. The teachers love it and it is my way of thanking them for asking PAS to be at their event. I love doing it and the teachers love receiving the Box Tops.

Thank you so much for collecting them!

Tips from the Telescope Nerd: Grand Canyon Star Party

By Will Kalif, PAS Member

A review of the Grand Canyon Star Party: When I travel somewhere I usually say something like "I stayed there one week". Or "I stayed there five days". But in the case of my most recent trip I am going to say that I stayed there five nights! That's because it was the nights that were important. I went to the annual Grand Canyon Star Party at the south rim! Yay! And I had a wonderful time.

Every year during a new moon the Grand Canyon National Park hosts a star gazing party. And this one was special because this year marks the 100th Anniversary of the park. There are 2 locations at the Grand Canyon for star parties every year, the North Rim and the South Rim.

Rangers estimate that at event there were between 60 and 70 telescopes; and that approximately 10,000 visitors showed up during the entirety of the week. All in all, it was a wonderful event both for amateur astronomers and for the public in general.

I spent a lot of time speaking to many of the amateur astronomers and they represented many clubs including clubs here in Arizona and in California. I also met a couple who traveled all the way from New York specifically for this event.

And it is no wonder that the event has a strong draw, because the night sky over the Grand Canyon is extremely dark and deep. It is among the best night viewing in America – the Milky Way really pops – and it was out and brightly making its presence known for most of the week. There were a couple of partly cloudy nights, but overall, the week was a big success. Every night there was some kind of a free presentation which usually was about astrophotography, and every half hour they had free constellation tours.

Once darkness hit the canyon the pub-

lic was free to roam around the parking lot behind the visitor center where all the telescopes were. The lines got long, especially at the bigger telescopes.

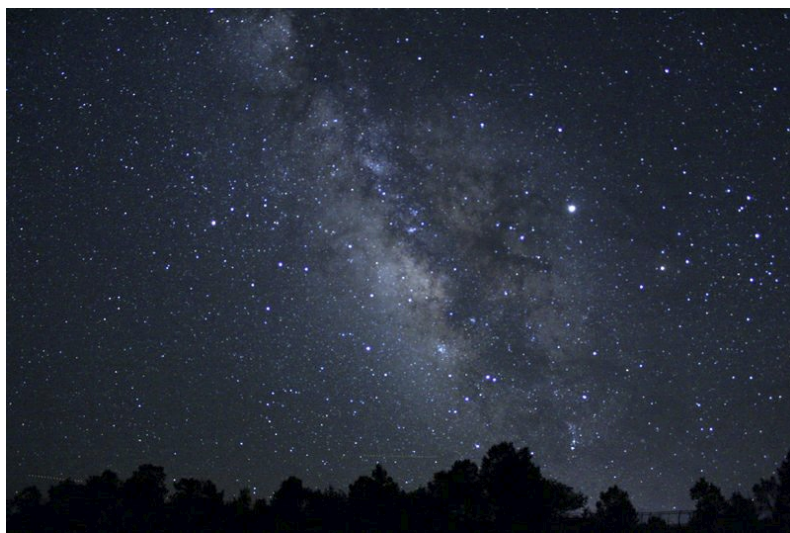
There were excellent views of Mercury shortly after sunset and Jupiter and the usual array of summer Messier objects as the sky got darker.

I also attended two of the astrophotography workshops and even as a beginner I learned how to take some terrific Milky Way pictures. Included here with this article is one of the pictures.

All in all, the week long event was a big success both for amateur astronomers and the general public. And if you live here in Arizona and have never been to it, I highly recommend you schedule it in for next year. It is a fantastic event and a great opportunity to talk with other amateur astronomers and even look through their telescopes.

Oh, and at this event there was even a forty-one inch truss tube Dobsonian. How often do you get the chance to look through something like that!

If you want to see more pictures of the event, the milky way and the telescopes visit my website here: <http://telescopenerd.com/the-2019-grand-canyon-star-party.htm>



This is the Milkyway as photographed by Will Kalif, taken at the Grand Canyon Star Party of June 2019.

MEET THE AUTHOR

Will Kalif currently resides in Phoenix, is an amateur astronomer and the author of "See it With a Small Telescope". You can learn more about him and his book on his website at TelescopeNerd.com



Will Kalif, Author, Astronomer and PAS Member. Photo provided by Will K.

Dynamite Montessori Star Party April 26

By Terri, Event Manager

Paula writes: We had a terrific time last night! Thank you for facilitating the stargazing with so much educational information and enthusiasm!

Terri writes: Paula Fabian-Leach requested a telescope from PAS attend her

school sleep over on Apr 26. Set up for this event was 6pm and the event was from 7pm to 9pm. Terri Finch attended with Storm Moon to provide one 8" telescope for this event. We brought Storm's telescope and it was a wonderful evening.

We arrived about 5:30pm, and Paula

wasn't ready for us to be there quite so soon, but we got set up in a field below the school. While we were setting up and enjoying dinner provided by Paula (a nice veggie wrap, some potato salad and noodle salad, plus bottled water) the attendees of the evening's star party started showing up.

See "Dynamite Montessori Star Party" on bottom of page 9.



Chill Out: Spot an Ice Giant

By David Prosper

Is the summer heat getting to you? Cool off overnight while spotting one of the solar system's ice giants: **Neptune!** It's the perfect way to commemorate the 30th anniversary of Voyager 2's flyby.

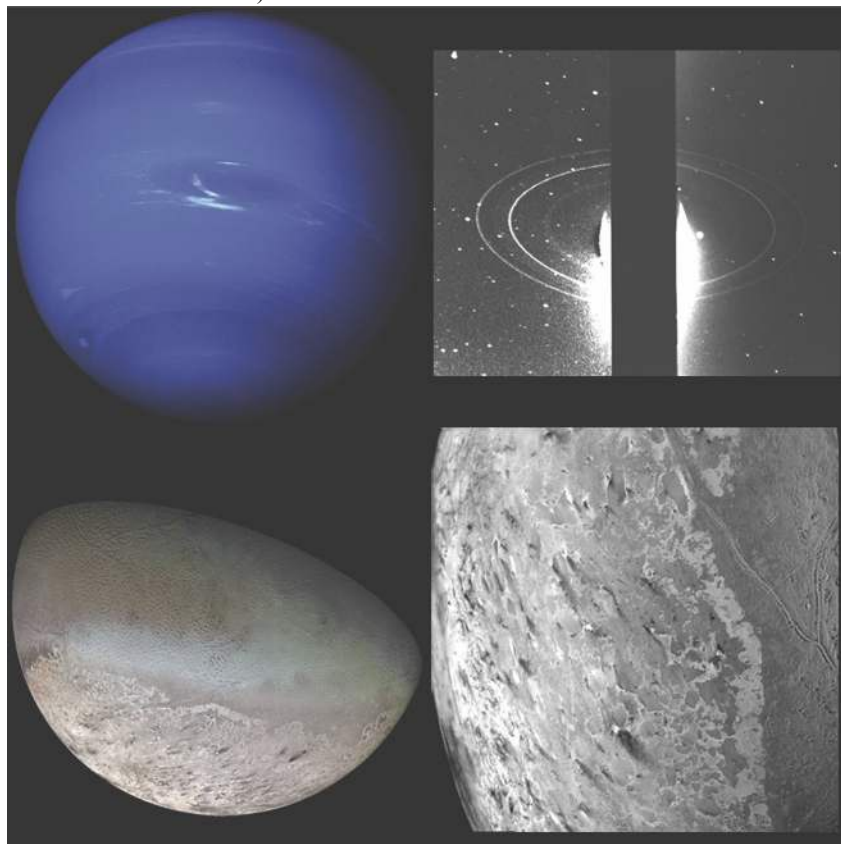
Neptune is too dim to see with your unaided eye so you'll need a telescope to find it. Neptune is at opposition in September, but its brightness and apparent size won't change dramatically as it's so distant; the planet is usually just under 8th magnitude and 4.5 billion kilometers away. You can see Neptune with binoculars but a telescope is recommended if you want to discern its disc; the distant world reveals a very small but discernible disc at high magnification. Neptune currently appears in Aquarius, a constellation lacking in bright stars, which adds difficulty to pinpointing its exact location. Fortunately, the Moon travels past Neptune the night of August 16th, passing less than six degrees apart (or about 12 Moon widths) at their closest. If

the Moon's glare overwhelms Neptune's dim light, you can still use its location that evening to mark the general area to search on a darker night. Another Neptune-spotting tip: Draw an imaginary line from bright southern star Fomalhaut up to the Great Square of Pegasus, then mark a point roughly in the middle and search there, in the eastern edge of Aquarius. If you spot a blue-ish star, swap your telescope's eyepiece to zoom in as much as possible. Is the suspect blue "star" now a tiny disc, while the surrounding stars remain points of white light? You've found Neptune!

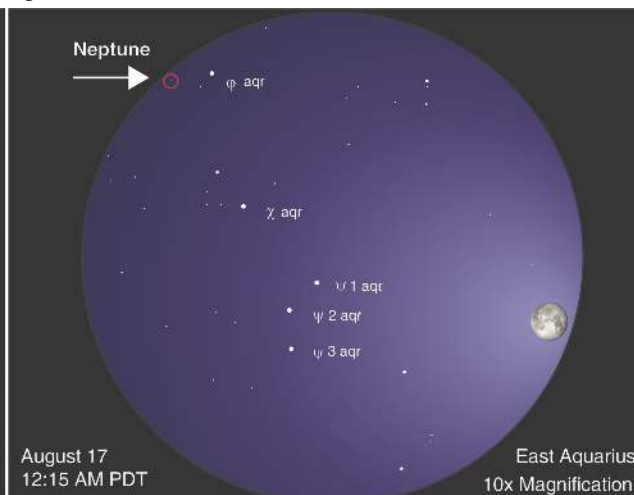
Neptune and Uranus are ice giant planets. These worlds are larger than terrestrial worlds like Earth but smaller than gas giants like Jupiter. Neptune's atmosphere contains hydrogen and helium like a gas giant, but also methane, which gives it a striking blue color. The "ice" in "ice giant" refers to the mix of ammonia, methane, and water that makes up most of Neptune's mass, located in the planet's large, dense,

hot mantle. This mantle surrounds an Earth-size rocky core. Neptune possesses a faint ring system and 13 confirmed moons. NASA's Voyager 2 mission made a very close flyby on August 25, 1989. It revealed a dynamic, stormy world streaked by the fastest winds in the solar system, their ferocity fueled by the planet's surprisingly strong internal heating. Triton, Neptune's largest moon, was discovered to be geologically active, with cryovolcanoes erupting nitrogen gas and dust dotting its surface, and a mottled "cantaloupe" terrain made up of hard water ice. Triton is similar to Pluto in size and composition, and orbits Neptune in the opposite direction of the planet's rotation, unlike every other large moon in the solar system. These clues lead scientists to conclude that this unusual moon is likely a captured Kuiper Belt object.

Discover more about Voyager 2, along with all of NASA's past, present, and future missions, at nasa.gov



Clockwise from top left: Neptune and the Great Dark Spot traced by white clouds; Neptune's rings; Triton and its famed icy cantaloupe surface; close of up Triton's surface, with dark streaks indicating possible cryovolcano activity. Find more images and science from Voyager 2's flyby at bit.ly/NeptuneVoyager2 Image Credit: NASA/JPL



Finder chart for Neptune. This is a simulated view through 10x50 binoculars (10x magnification). Please note that the sizes of stars in this chart indicate their brightness, not their actual size. Moon image courtesy NASA Scientific Visualization Studio; chart created with assistance from Stellarium.



Roger Anzini provided this fun photo of the Telescope Team setting up at Benchmark School on Apr 12 2019. We waited for a rain storm to pass by and provide a super rainbow. Then it turned into a fantastic observing evening.

Black Mountain Campus (BMC) Star Parties

By Terri, Event Manager

These events have been added to the PAS Website for Fall 2019 into Spring 2020. If you plan to attend, RSVP is highly suggested because bad weather will cancel this type of event. An RSVP to Events@pasaz.org with the number in your party ensures you will be updated about the status of the event you wish to attend. Any changes to the events will be emailed to those who RSVP by 4pm the day of the event. Please include the event date and name in all RSVP's. Here is the complete list, live on the PAS website with the links for your RSVP convenience: <http://www.pasaz.org/forums/showthread.php?p=3400#post3400>

Sept 26 2019:

Whole Event is from 5:30pm to 9:30pm Indoor: 5:30pm to 9:30pm Outdoor Star Party: 6:30pm -9:30pm Star Party set up: 5:30pm Highlights of this night are: Saturn and Jupiter

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2988&day=2019-9-26>

Oct 24 2019:

Whole Event is from 5pm to 9:30pm Indoor: 5pm to 9:30pm Outdoor Star Party: 6pm -9:30pm Star Party set up is 5pm Highlights of this night are: Saturn, Jupiter, and Venus.

Calendar Link for this event:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2989&day=2019-10-24>

Nov 21 2019:

Whole Event is from 5pm to 9:30pm Indoor: 5pm to 9:30pm Outdoor Star Party: 6pm -9:30pm Star Party set up is 5pm Highlights of this night are: Saturn, Jupiter, Venus & Orion Nebula

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2990&day=2019-11-21>

Jan 23 2020:

Whole Event is from 5pm to 9:30pm : 5pm to 9:30pm Outdoor Star Party: 6pm -9:30pm Star Party set up is 5pm Highlights of this night are: Venus & Orion Nebula

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2991&day=2020-1-23>

Feb 20 2020:

Whole Event is from 5:30pm to 9:30pm Indoor: 5:30pm to 9:30pm Outdoor Star Party: 6:30pm -9:30pm Star Party set up is 5:30pm Highlights of this night are: Venus & Orion Nebula

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2992&day=2020-2-20>

Mar 5 2020:

STEAM-tastic Event !!! Whole Event is from 4pm to 9:30pm Indoor: 4pm to 9:30pm Outdoor Star Party: 6:30pm to

9:30pm Star Party set up is 5:30pm Moon in Daytime 82% lit Highlights of this night are: Venus & Orion Nebula

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2872&day=2020-3-5>

Mar 19 2020:

Whole Event is from 6pm to 9:30pm Indoor: 6pm to 9:30pm Outdoor Star Party: 7pm -9:30pm Star Party set up is 6pm Highlights of this night are: Venus & Orion Nebula Moon is up throughout the event and 82% lit

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2993&day=2020-3-19>

Apr 16 2020:

Whole Event is from 6pm to 9:30pm Indoor: 6pm to 9:30pm Outdoor Star Party: 7pm -9:30pm Star Party set up is 6pm Highlights of this night are: Venus & Orion Nebula

Calendar Link for this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2994&day=2020-4-16>

Always check the on-line PAS calendar link (above) for the status of an event before you attend, in case the event has been cancelled, or the start or end time has been changed. PAS would love to have you attend these "fun for all ages" astronomy events.

Dynamite Montessori Star Party

(Continued from page 7)

A bunch of kids, many parents, five tents were set up, a fire pit was lit. Storm and I were set up far away from all the brightly lit activities of the attendees.

The sky was gorgeous all night long and the field we were in was below the horizon so that we didn't have hardly any stray light shining on us, except for the leaving vehicles, from the school parking lot and the white flashlights of the kids around the tent and fire pit area shining them our way. No jacket was needed as the temperature of the evening was perfect. Storm and I were able to show a whole bunch of objects to the attendees. I would guess there were about 50 attending adults and kids. We shared views of Mars, M3,

M5, M13 Hercules Globular Cluster, M 36, M37, M42, M 44, M51 Whirlpool Galaxy, M53, M103, M104 Sombrero Galaxy. This was the most successful viewing evening for Storm and myself in a very long time in which we were able to view some great objects I haven't seen in my scope before. Not everything was spectacular to see, but we found them, showed them and those who hung around to the end, got to see some great objects. We had one young boy and his mom and dad, who was so enthusiastic we went out of our way to find more objects to entice him with. I had a minion whom I appreciated. I sent her over to announce what objects we were showing and draw a crowd to the telescope, a couple

of times. I also went over one time to the tent area and called over a bunch of people to see the Orion Nebula before it set for the night.

This was a really awesome location to do a star party. I do hope to be able to return in the future and next time, we will set up deeper into the field area to get away from the car lights of the parking lot because where we were set up was exposed to the exit from the parking lot and so every car leaving had its headlights on the scope set up area, not knowing they were messing up the night vision of those who were waiting to see some really faint objects. Many thanks to Paula for a fine dinner, and a great event!

Fountain Hills Star Party March 30

By Sam Insana, PAS Member

Fountain Hills had its annual dark skies celebration Saturday night, March 30th. They had astronomy art contests by local school children. They also had fine speakers from Lowell Observatory, the Meteorite Man Geoff Notkin, and others. There was music and food and silent auctions on astronomy equipment. The event was from 2:00 pm until 9:00 pm. Ted Blank, who is President of the Fountain Hills Astronomy Club, was the major force putting this great event together. Hundreds of people showed up to enjoy the festivities. During the day there was solar observing and at night stargazing. Ted Blank, Mark Johnston, Calvin Vance, Rick Cunningham and I furnished telescopes from PAS. Mark and I had hydrogen alpha filters on our scopes so we showed two small flares on the sun. The others showed no sunspots since we are in a solar minimum, however people still enjoyed seeing the solar disk. At night everyone showed several objects

like the Orion Nebula, double stars, galaxies, open star clusters, etc.... There were about another half dozen telescopes from other astronomy clubs like EVAC and the Fountain Hills Astronomy Club. There was always a line at each telescope.

Mike Marron, the President of PAS, had his meteorite collection and stayed the latest, until after 9:30 pm, again drawing crowds of people.

The skies were clear until about 8:30 pm when clouds rolled in. Most people left by 9:00 pm. No wind and mild temperatures made it a pleasant event.



The public enjoyed a wonderful view through Mark's Solar Scope at the Fountain Hills Star Party of Apr 30. Photo taken by Mark.

Free Telescope Workshop at PVCC April 11

By Terri, Event Manager

It was a cloudy night. I watched the forecast change from partly clear to mostly cloudy and then by the time of the telescope workshop, we were overcast. I didn't cancel the workshop this time for the clouds. But I did send out a confirmation email asking the two RSVP's if they were going to make it to that night's workshop and when they both confirmed attendance, I decided to have the event.

In attendance from PAS was William and Terri Finch, Rick Cunningham, Sam Insana, and Calvin Vance. Cal had brought his 6" Dobsonian and two binoculars to show and tell. When we arrived it was overcast, so everyone started indoors. Then, as the night went on, I walked outside about 7:30 pm, saw the clouds over the Moon, but could see the Moon just fine, so I asked Cal to bring his scope outdoors. We also brought the two attendees scopes outdoors to help them align and figure out what they needed help with.

Rick and Sam helped Elizabeth and Mark Milton with their Meade ETX from the 90's. This was a cute table top scope they had on a tall tripod. William and Cal helped Jessica Dandanville + 1. Jessica had an 8" Celestron NexStar on an EQ mount that had tracking running in the opposite direction (for southern hemisphere) and she

had checked all the known reasons this might happen and was at a loss. So Cal, William and another attendee of this night's event, Will Kalif, brainstormed with her dad, John, to figure out why the scope is going backwards. Didn't figure it out while indoors, so we moved outdoors.

The 5th attendee was Will Kalif, author of "See It With A Small Telescope." He was talking about his books at this event and offered a few to the attendees, as well as Sam and me. You can find out more about his book at this link: <http://telescopenerd.com/>. Will was very helpful at this event.

So, outside we had set up Jessica's 8",

Elizabeth's 90mm and Calvin's 6" Dobsonian and we had a great observing session of the Moon, as that is all we could see, but it helped the attendees do their alignments and figure out what was going on with the tracking situation.

While there, Jenny Weitz and two of her honor students were playing around with the Dome on the observing deck and the new 11" scope inside it. I'm not sure what they were doing but they finished about ½ hour before we did for the night.

Around 9:00 pm we started packing up and closing up the event. It was a great success and lots of fun meeting the people and meeting Will Kalif.



At the April 11 2019 PVCC Telescope Workshop, several folk from the public (class members) attended this event to find out how to work their telescopes. Will Kalif took this fantastic photo inside G147 during this event.

Cub Scout Star Party April 13

By Sam Insana

Sam reviews the event as: The St. Thomas Scouts star party had about 100 boys and girls and a few dozen adults. The event began with Roger and I speaking about PAS and also what we would be showing through our telescopes. I showed the moon, first with low power and then with high power to zoom in on a few craters with mountain peaks in them. Later I showed Mizar and Alcor double star.

Roger concentrated on the Orion Nebula and Betelgeuse. There was a barbeque for everyone and it was a festive atmosphere. The children then retired to their tents for the night long sleepover. The children were very well behaved and very interested in the night sky. The only problem was a tall parking structure with very bright lights to the north of our setup area. This limited our viewing to the few bright objects we showed

Amy Bowles writes: Hi Terri, I just wanted to thank you for your help. Both the kids and parents greatly enjoyed the telescopes and viewing Orion's belt and the moon. We all learned so much about space and how vast it truly is! Thank you so much!

Terri, PAS Event Manager writes: Roger Anzini and Sam Insana supported this fantastic event at Saint Thomas the Apostle Roman Catholic Church from 7pm to 9pm on April 13 for a group of Cub Scouts.

Roger writes: The church location has about a 6 acre compound surrounded by 4 story condos and a 5 story parking garage in the back. Perhaps 250 Cub Scout and Girl Scouts pitched tents all along the west wall lawn. Sam and I nestled in the far back corner in order to view the Moon and Orion and we were successful. We enjoyed the offered hot dogs and chips while the kids listened to stories around the huge campfire

before viewing our objects. Very enthusiastic kids and super friendly staff made this a

great night of happy smiles all around.



*Sam's vehicle and scope are seen at the St. Thomas event of Apr 13 2019.
Photo by Roger.*



*Roger & Sam set up in the way back corner at this event to be able to show some fantastic objects.
This is Roger's scope and vehicle. Photo by Roger.*

Stellar Adventures Star Party April 24

By Mark Johnston

April 24 I did a Stellar Adventures Star Party for 11 people at the cookout site. Conditions were perfect, skies were 21.4 SQM, no clouds, a strong light dome from Phoenix and a smaller one from Globe, Az. The star party began shortly after 8PM when they arrived, I was set up and aligned. Cell reception (Tmobile) was poor, could

only intermittently send/receive texts.

Using my TEC140 refractor and night vision for faint objects, we observed Iota Cancer (blue/yellow binary), Castor (sextuple), M42, M1, M104 (dust lane clearly visible), M81/82, M3 globular, Stargate Cluster, Ghost of Jupiter, Eskimo nebula (halo quite clear), Markarian's Chain (7 galaxies visible in the field). One Hummer

left, and the diehards asked for one last object, so I showed them Quasar 3C 273. None of them of course had seen an object 2.4B LY away before, even though it just looked like a star. A thoughtful way to end the event.

Everyone had a great time and thankfully all my equipment worked well. Wrapped up about 9:50pm.

Awards Ceremony and Meeting of the Minds

By Terri, Event Manager

The evening of April 18, 2019 began in room LS-203 at PVCC Main Campus with the Annual Awards Ceremony & Pizza Party. This event is held each year to congratulate the many PAS Members who attended Public Outreach events in 2018. This year PAS provided beautiful certificates and NSN Pins to 19 PAS Members. The Night Sky Network provides pins to astronomy club members for attending a minimum of 5 public outreach events throughout the year.

This year's certificates were printed by Bruce Wurst. The pins were provided by PAS to members achieving the 5 public outreach event criteria. This year, certificates and NSN Pins were given to Ron Walker, Ed & Bette Wurst, Ted Blank, Calvin Vance, Jake Von Ruhr, Paul Facuna, Mark Johnston, Ofelia Waters, Pete Turner, Bruce Wurst, Don Boyd, Storm Moon, Roger Anzini, Mike Marron, William Finch, Rick Cunningham, Sam Insana and Terri Finch. If your name is listed in this article and you haven't picked up your pin and certificate, please do so at a future event you meet up with me. I wish to thank everyone who donated at this event to the snack fund to pay for this night's pizza. Ten pizzas were ordered for this event. I wish to also thank those who brought desert to be shared.

At the end of the Awards Ceremony, tickets were given out for a raffle of all the items that were left over from the PAS 70th Anniversary celebration that was held at BMC on Oct 11, 2018 and Nov 8, 2018. There were 10 prizes that were raffled, but the winners never came to pick them up, so one ticket was given to each attendee at the Awards Ceremony, and then an additional ticket was provided to everyone who received an award at this event. There were 11 prizes to be won and they were all awarded on this night.

After the Awards Ceremony concluded, there was a 10 minute break while those who weren't interested in staying for the Meeting of the Minds, were given time to leave. Then we held the Meeting of the Minds for about an hour. The entire evening ended about 10pm. It was a good evening for all and I wish to congratulate everyone who received an Award for their public outreach in 2018.

The Night Sky Network provided a wonderful pin this year in bronze color. The letter that accompanied the pins has this to

say (shortened to only the important parts): To the volunteers of the Phoenix Astronomical Society: Congratulations from the NASA Night Sky Network on your organization's enthusiastic dedication to astronomy outreach in 2018! As a result of your commitment to sharing the wonders of the sky and the latest in NASA's discoveries, we award you these enclosed pins honoring our first steps on a new world. Night Sky Network Star 50th Anniversary of Apollo 11: 1969-2019 On July 21, 2069, human beings took their first steps on the Moon.

Neil Armstrong and Buzz Aldrin spent over 2 hours exploring the lunar landscape of the Sea of Tranquility, setting up instruments, making measurements, and taking samples of lunar soil and rock back into their lunar lander, the Eagle. High above, Michael Collins orbited the Moon in the command module Columbia, making certain that the command module was ready to bring them all home safely back to Earth after Neil and Buzz's return from the lunar surface. This year we will remember together.

We hope these award pins and certificates help show our appreciation of the efforts of your organization's hard-working volunteers. NASA, the Jet Propulsion Lab, and the Astronomical Society of the Pacific



While the pizza is still warm, many PAS Members gather around to a few slices to enjoy at the PAS Awards Ceremony of Apr 18 2019.

Photo taken by Will Kalif.



PAS held it's annual Awards Ceremony on Apr 18th at PVCC. Many PAS Members received a beautifully printed NSN Certificate with a matching Pin.

Photo by Will Kalif.



After the Pizza and Awards Ceremony, PAS held a brief Meeting of the Minds (the Business Meeting of PAS). We gathered around the table to have a discussion. Photo by Will Kalif.

deeply admire your hard work bringing the wonders of space science to the public. Your volunteers are inspiring the next generation of scientists and engineers to reach for the stars. We look forward to supporting your efforts in making 2019 another outstanding year for astronomy outreach. Thank you again for bringing the sky to everyone! Vivian White & Dave Prosper, Night Sky Network Administrators.

Leprecon Convention April 20

By Terri, Event Manager

This was a fun convention and it was the second year PAS was invited to be at this convention, along with doing the Labor Day convention of Cokocon.

There are two parts to this event. The indoor / daytime event is where PAS sets up a table, promotes the club and announces the upcoming outdoor, evening star party. The convention officially starts on Thursday, but PAS wasn't involved in the Thursday part of this event. So, Friday morning, Mike Marron with his meteorites along with Terri Finch and the PAS table, arrived at Leprecon to set up indoors. Leprecon is held this year at the Doubletree at Metro Center Mall. Set up is 9:30am, and Mike and Terri arrived about 9:15am on Friday Apr 19th. From 10am to about 5pm, at the PAS table, Mike talked meteorites with everyone who stopped by, and I promoted the evening's star party. Storm Moon arrived about 2:30pm to help at the PAS table. William Finch arrived about 3:30 to help as well. Then, about 5pm, the William, Storm and I went to dinner at AJ Mongolian while Mike went up to the Con-Suite to enjoy food and talk to people up there.

We returned about 6:30pm, moved our table outdoors where we set up the PAS table, chairs, and Bruce Wurst arrived with his 12" telescope about 6:45pm. When we did Cokocon last August, we were told to be off the grass at a certain time so the sprinklers do not ruin our equipment. We couldn't remember what time that was, so we packed it in about 8:45pm. Bruce and Storm went home. William, Mike and I wandered around to the different locations that had food and met up with our friends we saw at the conventions. We left about 11:30pm and the sprinklers had not turned on at all. For the Star Party, Bruce was able to show the Orion Nebula. Mars and the Moon had already set or were behind the buildings. We had about 10 patrons of the convention stop by to enjoy the view of Orion Nebula before we packed up.

Saturday April 20 was similar, except this time we arrived about 10:15, with Mike, William and me getting there about the same time. Mike set up his meteorites and I set up the PAS table. The three of us spent the day at our table. Mike went to one of the presentations and Dr. David Williams (a favorite guest speaker and friend of PAS was doing presentations all weekend long) stopped by to visit the PAS table for

a short while. That evening the plan was to show the same things in the night sky. Bruce arrived with his scope again and then it got super windy and cloudy and so I told Bruce to go home and we decided against setting up for a star party. The storm blew through and it was about 10pm before it stopped. So, no star party was held on Saturday.

Then on Sunday, William and I went back for free food, chatting with our friends, and hanging out with the people who run the convention for a few hours. We met up with some of our friends and had dinner with them in the evening. We did not attend the Closing Ceremonies this year.

It was a good event; however, the weather messed up the star party, and the attendance at this convention was quite small due to a miscommunication between the Lepre-

con people and the Doubletree. Also, PAS could have used more help from other members at this event to give the indoor team some bathroom breaks and chances to go to some of the presentations. Looking forward to doing Cokocon on Labor Day weekend 2019.



At the Leprecon convention held in Phoenix this year, PAS was asked to be there. During the day, PAS had a table indoors with info about the club on one side and Mike Marron with his Meteorites on the other side of the table. Photo taken by Terri Finch on Apr 19.

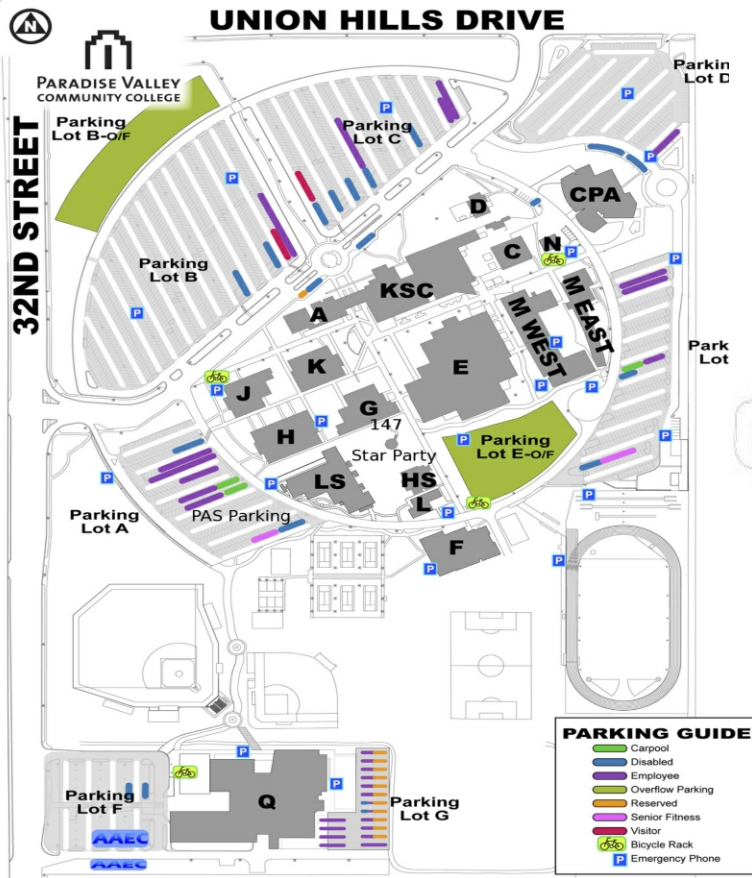


During the evening hours at Leprecon, PAS set up at table outdoors along with the telescopes. William Finch is seen at this table along with 2 cosplay attendees of the convention, Rachel & Talon. Bruce Wurst brought his scope and set up behind the table up on the raised brick behind this table.

Photo by Terri.

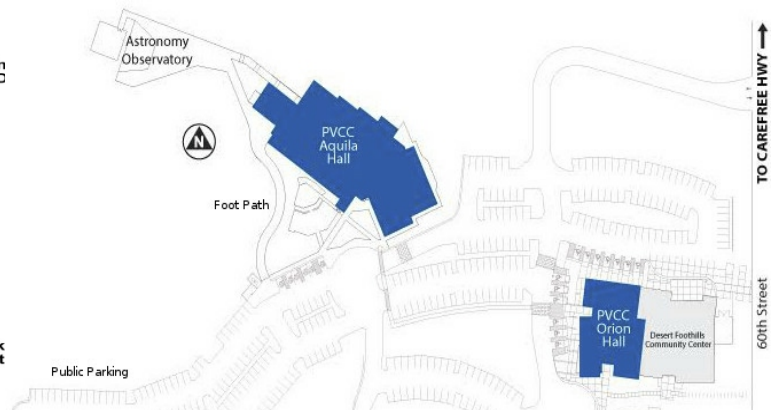
Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



2019 PAS GUEST SPEAKER LINE-UP

By Terri Finch, Event Manager Events@pasaz.org

PAS Meetings are held at PVCC Main Campus on the first Thursday of the month in Room: LS-203 unless otherwise noted. Do you have an idea for a guest speaker? Email Terri Finch, Paul Facuna, or Mike Marron the details (their email addresses are at the top of page 2 in this newsletter).

Here are the next scheduled guest speakers at PAS:

Oct 3: Klaus Brasch: Title: "The Research Legacy of Lowell Observatory"

Nov 7: Dr. Gerard van Belle: Topic: Lowell Telescopes and the Navy Precision Optical Interferometer

Dec 5: David Williams: Topic: Nasa Small Body Missions

More information at:

<http://www.pasaz.org/index.php?pageid=meetings>

Bookmans Telescope Workshop April 14

By Terri, Event Manager

William Finch and I arrived at Bookmans at 2:40pm to find that Bookmans didn't know we were coming on this date to do a Telescope Workshop, so they had given up our front door location to a DnD group. Since we were already there, we scraped together some chairs and a table and set up in a back alcove of one of the book racks. This wasn't super convenient, but we made it work, and by 3:00pm we were organized and ready to get down to business.

About then, Sam Insana and Roger Anzini arrived to help at this workshop. We also had the help of new member Will Kalif.

The event had two public RSVP's attend: Kamilyn with Erik wanted to know

what telescope to purchase. William and I assisted them with advice. Nicole and Claire brought their Celestron NexStar 102 GT to Bookmans and set it up in the little alcove and had the help of Sam, Roger and Will.

While we packed up, Lori Wheeler, our contact at Bookmans came over and shared that Bookmans has decided they no longer want PAS taking up floor space for indoor events, such as the Telescope Workshops. But, if we wanted to, we could still do the outdoor activities that PAS has been doing, since that doesn't affect anyone trying to purchase items from Bookmans.

At the Meeting of the Minds held after the April 18th PAS Awards Ceremony, it was decided by the attendees of that meet-

ing, that because Bookmans decided that PAS can no longer use their location for our Telescope Workshops, PAS will no longer use Bookmans location for any events. We will seek a new venue for the Telescope Workshops and any outdoor public Sidewalk Astronomy events we wish to do. I have removed all upcoming events at Bookmans from the PAS calendar.

Otherwise, the event was a success. Thank you to my Telescope Team for being there and helping to create a usable space squished in one of the book racks at the back of Bookmans. And thank you to the four attendees who came, got help, and were very understanding of the limited space provided by Bookmans at this event.

Pinnacle Peak Park Public Star Party June 8

By Mark Johnston

Had a great star party last night at Pinnacle Peak Park. Showed the Moon, Mars,

Jupiter, M13, Markarian's Chain, Izar, Epsilon Lyra, M57, and the Stargate Cluster. Pointed out many constellations with the

green laser. One visitor from Orlando said, "This was the highlight of my trip to Arizona!"