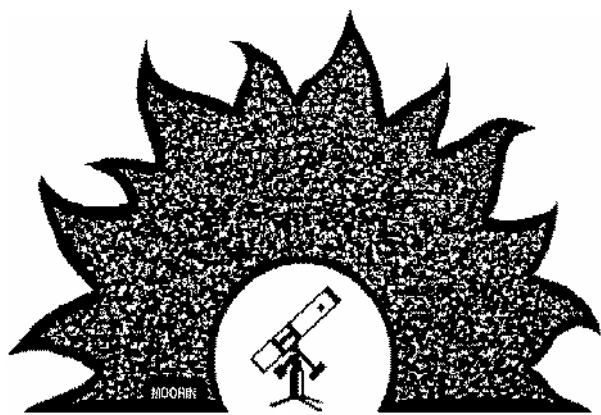




PAStimes

Phoenix Astronomical Society

www.pasaz.org

November 2015

Volume 67 Issue 3

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Dennis Young to Speak at Wednesday November 4 PAS Meeting 7pm

By Terri, Event Manager

Everyone is welcome at our November meeting. Come and meet energetic astronomer and long-time PAS honorary member, Dennis Young. Dennis comes to us with some great new information to share. Bring some cash too, as he usually has his Astro-Scenic-Photos of Arizona available for sale (you can see examples of these photos at

the link below). Bring a friend or the whole family and bring a snack to share. See you there! We will be meeting for dinner prior to the meeting at Deer Valley Airport Restaurant at 4:30, so sign up on the website if you wish to come chat with the guest speaker prior to the meeting. RSVP is required.

"Astro-Scenic-Photos of Arizona / The Building of Large Portable Telescope"

Provided by Dennis Young

From days past, the photos encompass images from all across the Arizona landscape, including comets, canyons, waterfalls, shooting stars, northern lights, and more.

A recently built, very large portable telescope is shown from Dennis Young of Sedona. This scope project is quite unique in that it incorporates unusual designs for the scope layout and is truly a one of kind scope. Dennis Young, a Sedona resident for



Dennis Young is an Honorary Member of PAS who has been doing Astronomy Sky Tours for over 35 years. Photo provided by Dennis.

many years, has been in the astronomy field for over 3 decades and is a professional astronomer as well as advocate of public outreach in astronomy.
<http://www.sedonastarlight.com/>

PAS Meeting Oct 1

By Terri, Event Manager

This was a fine night for a dinner and PAS Meeting. A group of seven of us met Rik and Dolores Hill at Deer Valley Airport Restaurant for a great dinner and conversation.

For the meeting, Rik and Dolores brought posters for the raffle, books for sale (cheap) and magazines to give away. The meeting opened with Sam introducing new attendees: Stefano as well as George who joined PAS this night. Congratulations George! Sam then introduced the officers of the club, made a few announcements and turned the meeting over to Rik for his presentation on the "Catalina Sky Survey." Rik's 1-hour presentation was full of infor-

mation and interesting details, leading to a lot of questions and discussion. After the talk, Sam presented a thank you gift and card to Mike for his service as Treasurer of the club. Past President Bruce then showed a framed photo and read a letter sent to PAS thanking us for the public outreach we do through PVCC. Sam then talked about Kevin's proposed field trip to Tucson and handed out copies with the details. Terri went over a few announcements regarding the Year in Space Calendars and 2016 membership renewals. Kevin won the main raffle and one of the posters; Dewell also won a poster. Finally we held a brief discussion on the newsletter and how to im-



Rik Hill at Oct 1 Meeting. His presentation was spectacular! Photo by Don.

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November 2015 Upcoming Events

By Terri, Event Manager

More events may be added to the Calendar, so check the website for updates at <http://www.pasaz.org/forums/calendar.php>.

Nov 1: Rock-a-Rama Solar Viewing event. Everyone welcome. Come view the Sun through safely filtered telescopes in Black Canyon City. See calendar for more info on this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1757&day=2015-1030&c=1>

Nov 4 Wednesday: PAS Meeting in Building Q Rm 120B, Doors open 7pm, Lecture starts at 7:30pm.. Come enjoy a wonderful presentation by a returning guest speaker. Bring a snack to share. Bottled water provided by PAS snack Fund. Everyone welcome. <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1633&day=2015-114&c=1>

Taking orders for Year in Space Calendar order. \$14/calendar. See Terri for details. Today is last day to place and pay for your order.

Nov 5: Free Lecture "Reading Galactic Jets" by Mike Marron. We will be in Room LS-204. This lecture is open to anyone who wishes to attend and is being recorded. . Doors open 6:30pm, Lecture starts at 7pm. Please hold all questions to the end of the presentation. Paper will be provided for you to take notes for your questions. Bring a snack to share. Bottled water will be provided by PAS. <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1846&day=2015-115&c=1>

Nov 5: Taurids Meteor Shower Peak - A meteor shower can be seen from 5 days prior to 5 days after the peak date. Find a dark location, like your back yard and enjoy the show.

Nov 6: School Star Party (Private). PAStimes Star Tour Members only.

Nov 10: School Star Party (Private). PAStimes Star Tour Members only.

Nov 11: CTCA (Private) Star Party

Nov 12: Huge public star party at Black Mountain Campus of PVCC, 60th Street and Carefree Hwy from 7pm to 10pm. Set up is 6pm for telescopes. Everyone welcome. RSVP is requested with Terri Events@pasaz.org. This event is weather permitting. When you RSVP by email, please include the number in your party. We usually provide 10-14 scopes for your viewing pleasure. Please do not touch the telescopes. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1396&day=2015-1112&c=1>

Nov 13: School Star Party (Private). PAStimes Star Tour Members only.

Nov 15: Free Telescope Workshop at Bookmans, 19th Ave and Northern in Phoenix - 3:30pm to 5:30pm. RSVP is required with Terri Events@pasaz.org. When you RSVP, email the make and model of the telescope you need assistance with. We also assist with suggestions and advice on what telescope to purchase to match your needs. We have no telescopes for sale at this event. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1388&day=2015-11>

[15&c=1](#)

Nov 17: School Star Party (Private). PAStimes Star Tour Members only.

Nov 17: Leonids Meteor Shower Peak - A meteor shower can be seen from 5 days prior to 5 days after the peak date. Find a dark location, like your back yard and enjoy the show.

Nov 19: PVCC Free Telescope Workshop at PVCC main campus, 32nd Street and Union Hills Rd - 7pm to 10pm with public star party. RSVP is required with Terri Events@pasaz.org. Seating is limited. When you RSVP, please leave your first name, and the make and model of your telescope. Bring your telescope and accessories to this event. We meet in G-147 and by the telescope dome on campus. We have no telescopes for sale at this event. This event is weather permitting. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1408&day=2015-1119&c=1>

Nov 21: "Rocket Riot" at Bookmans 19th Ave & Northern. Children's event is from 3pm to 4pm. PAS will be there with safely filtered telescopes (in the parking lot in front of Bookmans) to show you the Sun from 1pm to 4pm. Bring the whole family! Mike with his meteorites (set up in front of Bookmans store) will also be there so you can touch real meteorites and learn about them; Kevin will bring an extensive rocket display (set up of rocket display will be outside if it isn't windy, or indoors if it is windy). More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1842&day=2015-1121&c=1>

Nov 27: PAS will provide 4 telescopes for your evening sky viewing pleasure on clear evenings, or 2 displays (Mike with meteorites or Kevin with a variety of displays) for cloudy weather, at the Desert Botanical Gardens on this night from 5:30 to 9:30 for the Luminaria Event. Bring the whole family and visit PAS in the Desert Wildflower Loop Trail, to the right after you enter the garden. More details:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1663&day=2015-11-27&c=1>

Nov 28: PAS will provide 4 telescopes for your evening sky viewing pleasure on clear evenings, or 2 displays (Mike with meteorites or Kevin with a variety of displays) for cloudy weather, at the Desert Botanical Gardens on this night from 5:30 to 9:30 for the Luminaria Event. Bring the

whole family and visit PAS in the Desert Wildflower Loop Trail, to the right after you enter the garden. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=1664&day=2015-11-28&c=1>

Wow! This is a super-busy month for PAS. We hope to see you at many of these fun events!!! Please remember to RSVP where requested. ***

PAS Meeting Oct 1

Continued from page 1

prove the formatting and content.

Many thanks to Rik and Dolores for a spectacular presentation! In two weeks,

Rik will be retiring from the CSS work he does now, so, unemployed, we wish him new and fun things in his life. Rik definite-

ly wishes to be scheduled to present for us again next year - we look forward to his return!



President Sam gives Outgoing PAS Treasurer Mike Marron his "Gift of Service to PAS" for all the many years he was Treasurer. Mike on Left, Sam on Right. Photo by Terri.



Dolores & Rik Hill, the Guest Speakers at the Oct 1 PAS Meeting. Photo by Terri.



Past President Bruce does Show & Tell with Framed Photo that was given to PAS by PVCC for Public Outreach. Bruce reads the letter that came with the photo. The Photo and the Trophy that was awarded to PAS are being safely housed at Bruce's home. Photo by Terri Finch.

Frank & Sam Insana with Howard Moneta visiting the Discovery Channel Telescope during the Flagstaff Festival of Science On Sept 20, 2015. Photo provided by Sam.



December Meeting PAS Swap Meet

By Terri, Event Manager

At the December 2nd Wednesday PAS Meeting, we will be holding our Annual PAS Swap Meet. To better help you sell your items, please send me a brief description by email, no photos, to Events@pasaz.org, of what you wish to sell at this meeting so that I can help you by advertising it in the December newsletter. The deadline to get those items sent to me is November 15th. The Newsletter can be a great help for a successful sale, so do send

them.

One side of the room will be set up with tables for Swap Meet items which are available for auction. There will be a sheet of paper associated with each item that you can put your bid on. Please go a dollar or more higher than the previous bid on that item, and include your first name or initials. Bidding will start from 7-7:30pm, after which we will have our meeting. Bidding will conclude at the end of the meeting after

the guest speaker and raffle. The other side of the room will be set up like a garage sale. Items will have (usually negotiable) prices, first come first served. Once the meeting is officially done, we will square up the sales, purchases and swaps and get sold items into the hands of those who now own them.

Please pay cash for everything and be sure to bring enough to buy what you want. See you there!

2016 Year in Space Calendar

By Terri, Event Manager

So far, we have 5 calendars on order. I'd like to make it to 10 and save some money with the order. The November PAS meeting is the deadline to put in your order, so see me at the meeting or any other event before then to order (and pay cash) for your

calendar. I will put the order in shortly after the meeting so that we can receive our calendars by the December PAS meeting and the holidays. Here's the link preview what's in the 2016 calendars: <http://yearinspace.com/>. 1 copy of the cal-

endar is \$14. 2-9 copies are \$13 and 10+ copies are \$12 each. My goal is to get 10+ calendars ordered as a group so that we can save some money on the order. I look forward to purchasing the calendar for you so you can enjoy it through all of 2016!

Fireworks at Mike's house in Carefree July 3

By Terri, Event Coordinator

Many thanks to Mike for hosting this wonderful party. In attendance at this public event were: Sam Insana who brought St Louis BBQ Ribs and drinks, William and Terri Finch with pulled pork and ice cream drumsticks, Mike Marron - the host, Rodney Fong who brought some desert, Paul Facuna who brought rotisserie chicken and fruit, Don Boyd, Dewell Howell who made a delicious green chili stew, Eric and Ora Steinberg who brought meatballs and Creamsicles (delicious), Kevin Witts who brought sliced beef, potato salad and strawberries (very nice selection), Howard Moneta who brought green beans and corn (my fav's), Peter and Andi Turner and Roger Anzini who brought his daughter Sonya (and her stuffed Unicorn, "Rainbow"). Thank you all for bringing such yummy things to eat and share. We also had a nice visit with some guests who attended, Dr. Tom Stoffer and his girlfriend Barbara along with Mike's friend Joe Aquavella. Tom and Joe both became PAS members this night. Welcome! Attendance was 20, a good size for a party.

After dinner, Eric called a brief officer's meeting that convened in Mike's bedroom to address a few issues.

Following that, while waiting for the

fireworks to start, we enjoyed socializing in small groups. Mike also put on his big screen TV showing his "Murder at the Observatory" movie to a few attendees who enjoyed it. I took some photos that will be in the PAS Photo Gallery.

About 8:30pm it began to get dark and we started listening for the fireworks to start. Mike suggested that we walk out to check on them visually, so we gathered chairs and headed out to the end of the driveway. We sat or stood out there waiting, watching and dealing with a strong wind, some sprinkles of rain and more wind, but all we saw was a very nice lightning show. We hung out for another 5 or 10 minutes and then gave up and headed back to the house. We went back to our collection of socializing groups, until someone yelled "Fireworks!" and we headed back down the driveway, most down to the end. I hung back and viewed from a distance. From where I was, I could see a nice scene of a shadow from a bunch of trees and bushes on the left, then the fireworks in the middle and a little to the right, a nice lightning show going on. I ended up just staying there. When the show ended, the group headed back to the house. What's weird, is

that, the cars that were parked at the location where the fireworks were being set off were all leaving the fireworks area about 9:15, so there were lines of car lights leaving when the display finally started at 9:30. We could see the cars still leaving, and the fireworks as well! We all had thought that they were canceling the fireworks due to the coming storm.

Most of the attendees left around this time, though some had left before 9pm and some left right after the first attempt to see them.

We then enjoyed the ice cream that was supposed to go with us out to the fireworks show. There was plenty to go around and some left over for the next party on July 11th.

A group of us that stayed longer: Rodney, Storm, Don and I played a game that had us laughing our heads off - by morning, my sides were so sore. I believe it was about 12am when we finally headed home and rest of the party broke up, finally letting Mike rest up for the next week's party.

Many thanks to everyone who attended and helped make this fun event.

Tom writes (a few days after the event): It rained and poured when we left the party.

Astro Tech - The Hydrogen Line

By Alex Vrenios

Karl Jansky, a Bell Telephone Laboratory scientist, was asked to look into electrical interference caused by thunderstorms. A lightning strike can exhibit a potential of hundreds of millions of volts. The crackling noise produced by lightning causes electromagnetic interference to telephone systems that degrade the quality of a telephone conversation. Jansky's job was to examine this phenomenon in the hope that such noise could be either masked or eliminated somehow.

Jansky built a Bruce Curtain antenna, a 100 by 20 foot cage-like contraption that rotated 360 degrees every 20 minutes, detecting signals at 20.5 MHz. The received signal strength was plotted on a pen and paper strip chart. After much analysis he categorized the received signals as coming from nearby thunderstorms and distant thunderstorms. He also recorded a faint hiss coming from some unknown origin.

The direction this mystery signal was coming from showed up on his strip chart, but it drifted completely around the compass every twenty-four hours. He concluded that this signal was of stellar origin, outside our solar system from somewhere near the center of our galaxy.

This was in 1932, near the bottom of a solar activity cycle. Had it been near the top of a cycle, the electromagnetic energy from the Sun would have swamped this faint, extra-solar signal, and Jansky would probably have ignored the anomaly recorded on his chart, attributing it to the Sun. Jansky published his findings in a paper titled "Electrical Disturbances Apparently of Extraterrestrial Origin," which appeared in the Proceedings of the IRE in 1933.

Grote Reber lived in Wheaton, Illinois and was about to graduate as an Electrical Engineer from the Illinois Institute of Technology. Hearing of Jansky's paper, he de-

cided this was the kind of work he wanted to do and went to Bell Labs to get a job. Unfortunately, 1933 was the height of the Great Depression and there were no such jobs to be had.

Reber didn't let that stop him. A ham radio operator, he was prone to tinkering and built a 2-ton support for a 30-foot diameter dish antenna. Perfecting his design, he produced the world's first radio maps of the sky, making him the very first radio astronomer. In 1947 the government honored his work by relocating Reber's dish to the National Radio astronomy Observatory (NRAO) in Green Banks, West Virginia, directly across from a replica of Jansky's antenna.

Hearing of Jansky and Reber's work, Jan Oort assigned one of his students, Hendrik van de Hulst, the task of determining the theoretical reasons behind this faint hiss coming from outer space. In 1944, Hulst reasoned that since hydrogen was the most prevalent substance in the universe, it must be the source of the radio frequency emissions. He concluded that a slight instability in the hydrogen atom would cause it to release a minute amount of energy on average, once every eleven million years. And, since there are so many hydrogen atoms in outer space, these infrequent, individual "peeps" would amount to a continuous radio frequency roar. He predicted the existence of a hydrogen line, a radio frequency spectral line at a wavelength of 21 centimeters, or a frequency of 1.420 MHz.

C. A. Muller, Oort and van de Hulst collaborated in an effort to map out the neutral hydrogen our galaxy. These frequencies are not stopped by interstellar dust. Their radio maps were first to reveal the spiral structure of our galaxy.

In a previous article ("Observing Meteors," PAStimes, October 2015) I men-

tioned the Astronomical League's new Radio Astronomy Observation Program and described how its highest, gold-level award offered its own special challenges. One of the gold-level requirements includes the detection of hydrogen in the galactic plane by direct readings, using a radio telescope.

One may actually build an amateur radio astronomy telescope. Or one may also arrange to use a telescope built by someone else, or even one of the NRAO's telescopes, manipulated by you over the Internet. An amateur quality scope is not going to produce the intricate images of radio sources from the Very Large Array, of course, but it will detect a rise in signal strength when the galactic plane drifts across the scope's beam width, as the Earth turns under it.

The gain of such a system is on the order of 20 dBi at 1.2 MHz. Design candidates include a satellite dish of at least one meter in diameter, a 22-element Yagi beam antenna or a horn antenna about four feet long, with a 36-by-27 inch opening. The signals received are of such small intensity that one must use two microwave signal amplifiers in series, followed by a band pass filter for selectivity. A radio receiver of some sort (a software defined radio embedded in a USB device is a popular choice), which feeds audio into a signal strength meter/monitor with a readout that can be photographed or printed out as evidence of detection.

This, it turns out, is no trivial task. I am contemplating the construction of a horn antenna (plans are available online), but considering an earlier result of my using snips on sheet metal, having a metal duct-work fabricator build the basic structure would be a better option. Stay tuned.

Bookmans Telescope Workshop Aug 30

by Terri, Event Manager

This event had a good number of RSVP's lined up to attend, though several from MeetUp did not come. We still had good attendance with Melody Rose (+3) who brought her Simmons 6330, Hunter Bristley (+1) with a Meade 2080 8" SCT, Geronimo Valin and Adrian, both looking to find out what telescope to purchase. William and Rodney assisted Melody, Kevin

and Howard assisted Hunter (he and I had a great discussion about the club) and Eric assisted Adrian. Other PAS members there were: Terri Finch, Sam Insana and Storm Sallas. Kevin handed out his excellent informational page and spoke about it. Rodney then shared his experience of "The Best Advice Ever", William and I then spoke to those wanting to know what telescope to

buy, and the rest divided up to help the other attendees. It was an enjoyable workshop and very productive. Thanks so much to my telescope team for helping out.

Dinner was with Sam, William, Terri, Storm, Kevin, Howard, Alex and Diane, Eric and Ora and we went to Thai Lotus.

President's Corner

By Sam Insana, PAS President

We all enjoy our astronomy activities: stargazing, guest lecturers, telescope workshops and more, however, there is something magical about the phrase "Road Trip". Whether it is a 1000 mile journey with friends and family to see the upcoming 2017 total solar eclipse or a one hour drive to look for a potential meteorite, the ability to get away from the Valley and experience new places and things excites us all. In September, 7 PAS members traveled to Flagstaff for the annual Festival of Science. Vera, Frank, Sam, Howard, Bruce, Ed, and Bette enjoyed many programs on astronomy: over 90 topics from Pluto's flyby, to the latest on Mars rovers. Some of us toured the new Discovery Channel Telescope, and others did the once a year hike around the rim of Meteor Crater.

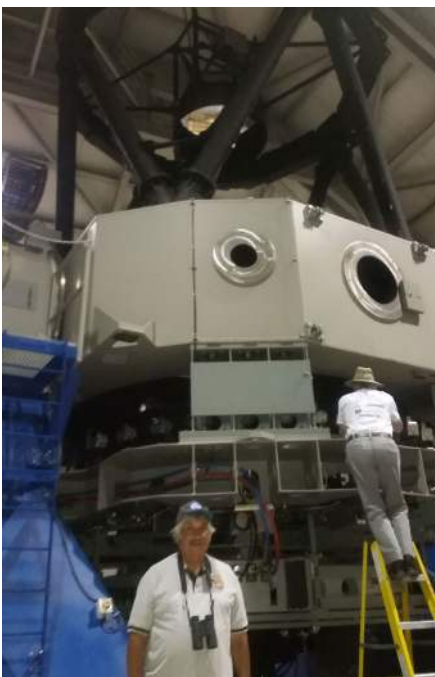
In November we are having over a dozen PAS members journey to Tucson for a field trip to Kitt Peak Observatory, binocular stargazing at Saguaro National Park, the Mirror Lab at U of A, and the Flandrau Science Center, planetarium and mineral museum. Traveling with fellow PAS members, enjoying a meal together, and exploring new places and ideas with your comrades who share your enthusiasm for astronomy is something not to be missed. Suggestions for future field trips are always welcomed.



Sam Insana at Wheeler Park during the Flagstaff Festival of Science on Sept 19 2015. Science in the Park with over 50 Free exhibits and demonstrations. Photo provided by Sam.



Sam Insana, Howard Moneta, Frank Insana at Buffalo Park Star Party in Flagstaff on Saturday Sept 19, 2015. There were 31 telescopes and over 1300 visitors. Photo provided by Sam.



Frank & Sam Insana with Howard Moneta visiting the Discovery Channel Telescope during the Flagstaff Festival of Science On Sept 20, 2015. Photo provided by Sam.



Vera and Sam hike the entire 2 1/2 mile rim of Meteor Crater during the Flagstaff Festival of Science on Sept 27 2015. Photo provided by Sam Insana.

Flagstaff Star Party Sept 17-19, 2015

By Howard Moneta, PAS Member

The Flagstaff star party was a huge success. On Saturday night when Sam Insana, Frank Insana, and I attended, there were 31 telescopes and more than 1300 visitors. ***

Free Public Lecture “Reading Galactic Jets” by Michael Marron-November 5

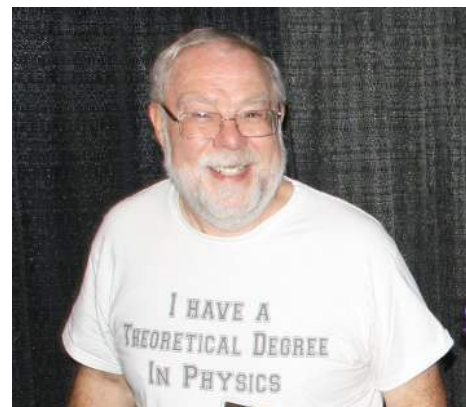
Location: PVCC Main Campus in Room LS-204
Doors open at 6:30. Lecture begins at 7pm

Mike has spent 45 years as an amateur astronomer in the Grand Rapids Amateur Astronomical Association and other clubs. As a youth he helped build the James C. Veen Observatory. Mike has wide ranging interests and can be heard talking about his contributions to theory that impact planetary geophysics, stellar mechanics, galactic evolution, reading stellar and galactic jets, cosmology, quantum physics, and prime numbers. Mike is rebuilding a century old ranch house in Carefree and has a 6" Celestron. Mike is PAS's Meteorite Man!

This lecture is called “Reading Galac-

tic Jets - The births and the formation of structures within dwarf, spiral, and elliptical galaxies.” Since the 1990's a large range of dark galaxies have been discovered and new details have come to light on how the oldest low-metal population II stars are born and evolve.

Bring a snack to share. Bottled water will be provided by PAS snack fund, please donate for next meeting. This Lecture is being recorded so please hold all questions to the end of the presentation and please enter the room quietly if you arrive after the lecture begins. Thank you.



Mike Marron “Reading Galactic Jets” Lecture
Nov 5, 2015. Photo by Sam Insana.



How we know Mars has liquid water on its surface

by Ethan Siegel

Of all the planets in the solar system other than our own, Mars is the one place with the most Earth-like past. Geological features on the surface such as dried up riverbeds, sedimentary patterns, mineral spherules nicknamed “blueberries,” and evidence of liquid-based erosion all tell the same story: that of a wet, watery past. But although we've found plenty of evidence for molecular water on Mars in the solid (ice) and gaseous (vapor) states, including in icecaps, clouds and subsurface ices exposed (and sublimated) by digging, that in no way meant there'd be water in its liquid phase today.

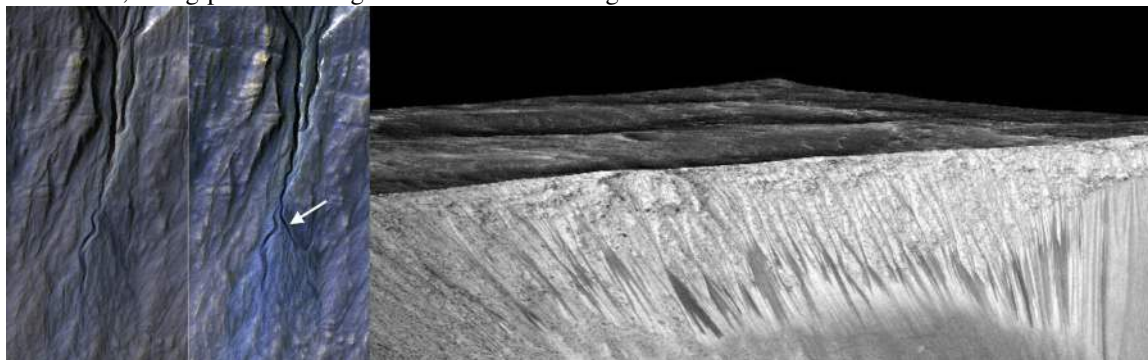
Sure, water flowed on the surface of Mars during the first billion years of the solar system, perhaps producing an ocean a mile deep, though the ocean presence is still much debated. Given that life on Earth took hold well within that time, it's conceivable that Mars was once a rich, living planet as

well. But unlike Earth, Mars is small: small enough that its interior cooled and lost its protective magnetic field, enabling the sun's solar wind to strip its atmosphere away. Without a significant atmosphere, the liquid phase of water became a virtual impossibility, and Mars became the arid world we know it to be today.

But certain ions—potassium, calcium, sodium, magnesium, chloride and fluoride, among others—get left behind when the liquid water disappears, leaving a “salt” residue of mineral salts (that may include table salt, sodium chloride) on the surface. While pure liquid water may not persist at standard Martian pressures and temperatures, extremely salty, briny water can indeed stay in a liquid state for extended periods under the conditions on the Red Planet. It's more of a “sandy crust” like you'd experience on the shore when the tide goes out than the flowing waters we're used

to in rivers on Earth, but it means that under the right temperature conditions, liquid water does exist on Mars today, at least in small amounts.

The measured presence and concentration of these salts, found in the dark streaks that come and go on steep crater walls, combined with our knowledge of how water behaves under certain physical and chemical conditions and the observations of changing features on the Martian surface supports the idea that this is the action of liquid water. Short of taking a sample and analyzing it in situ on Mars, this is the best current evidence we have for liquid water on our red neighbor. Next up? Finding out if there are any single-celled organisms hardy enough to survive and thrive under those conditions, possibly even native to Mars itself!



NASA/JPL-Caltech/Univ. of Arizona, of a newly-formed gully on the Martian surface (L) and of the series of gullies where the salt deposits were found (R).

LepreCon Science Fiction Convention June 26-27

By PAStimes Star Tour Members who attended this event

Friday, June 26, 2015:

Rick Cunningham writes: This evening's event was at the Embassy Suites on West Greenway, on a patio overlooking the pool (which looked inviting). Setup time was 6:30PM and we concluded our observations at 10:00PM. Sam had his 8" reflector, Kevin his 8" Celestron, and I had my 8" Dobsonian. Due to the patio lighting and intermittent clouds, we were limited to showing the Moon, Saturn, Venus, and Jupiter. I estimate about fifty different people took advantage of the views offered. I was able to find Venus by 6:45 pm, well before it became visible to the unaided eye; Jupiter soon followed with the darker bands appearing light blue and blending with the sky color, while the lighter colored bands showing pale white in the early evening sky. The four Galilean moons were also visible as the sun started to set.

Sam had great close up views of the Moon's craters, while Kevin was showing Saturn and I was showing Venus and Jupiter. Viewers commented at the apparent crescent shape of Venus versus a round orb, much like the moon. Repeat viewers observed the Galilean moon Io cross behind Jupiter leaving only Europa,

Ganymede and Callisto also became visible as the evening progressed. Many were amazed to learn that Jupiter currently has sixty-seven recognized and named moons, with 12 additional currently unnamed satellites.

Terri Finch writes: We had a great turnout in both telescopes and public. When William Finch, Storm Sallas and I arrived, Sam Insana was already getting unloaded and set up, but stopped to show me the Tribble he had purchased (see photo of Sam and the Tribble). Kevin Witts got there shortly after, followed by Rick Cunningham, and then Mike Marron. After heading to the Patio area, Storm, William and I set up the PAS Table and Mike took the table next to us for his Meteorites.

Mike, as usual, kept a crowd around his table the whole time.

The temperature was very warm and humid but there was a breeze. We had a great attendance: I'd estimate that 60+ people wandered out to see what we had. We were able to show the Moon, Saturn, Venus and Jupiter. We saw a bunch of really awesome costumes at this event. Later, Sam went off to see the Harp Twins play. He came back and told me I HAD TO go see them, so Storm and I went inside and watched the them for about 15 minutes. What a treat - thank you Sam! During the day, Sam had purchased a couple of the Harp Twins CD's and I made it my goal to do the same, the next day.

By 10 pm when the event finished, we were all alone outside - the rest of the LepreCon attendees were in parties, and having a great time in some other location at the venue. We packed up and headed home.

Many thanks to my telescope team for a very successful event and to Rick for a wonderful view of Jupiter.

Saturday, June 27, 2015:

Terri writes: The difference between the two days was amazing. William and I spent the day attending several events. We first walked the Dealer Room. We passed the table with the Tribbles (Too expensive, but a cute idea). At first, the Harp Twins weren't there, but by the time we had walked the whole room, they had returned to their table. I spent 20+ minutes talking with them, and got them to sign the three CD's I purchased. I've been following their progress on YouTube since they first started posting their Harp duets on line, about 5 years ago - it was amazing to see them.

William and I then went to the car to grab a bite to eat, and upon returning, attended the Harp Twins concert from 1:30 to 2:30pm. After the concert, we went to dinner at Chino Bandito. Pete and Andi were already there and Howard arrived shortly

after we did. We had a nice, relaxing dinner together, but then as we headed back to Embassy Suites, the wind and dust started picking up. When we got back, we gathered in the main area of the hotel, watching out the windows, and monitoring the weather.

About 6:30pm, Mike came rushing by, and I got up and ran after him to tell him not to go outside. I had gotten a notice from Don Boyd, who lives in Chandler, that a big storm had just gone past his house and was headed our way. At first, I thought it would miss us, but then the winds picked up and the dust in the air really increased. While we were waiting it out, the lady who asked me to be at this event (Amanda Parker) came by and asked if we thought we would be able to show anything this night. I told her we were waiting it out. Ultimately around 8:30pm the dust cleared, but the winds were still a little too rough to set up any telescope. Pete, Andi and Howard went home, while Mike got permission to set up a table indoors. Likewise, Storm and I set up our table indoors, while William went outdoors with the AstroScan and 10" Dob to show the Moon. He was able to show the Moon most of the time, and sometimes Jupiter & Venus, while hiding against the building to stay out of the wind. The clouds blocked viewing much of the time, however, with all the people I sent out to see him, he kept busy and we didn't pack up until 10:45pm.

We met a lot of really great people at this event. I'd like to thank my telescope team for being there, even if some of them didn't get to set up their telescopes for the event. I'd estimate 40+ people wandered out to see what William was showing in the telescope. In the end, I'd call it a successful event.

I would have loved to return on Sunday and visited with the Harp Twins some more, but we had the Bookmans Telescope Workshop to do. Looking forward to next year's event!



The Harp Twins: Kennerly & Camille. Look them up on YouTube. Awesome music. Photo by Terri



Captain Hook – one of the best dressed Cosplayers of the whole convention. Alex posed for the photo with Storm (left) and Terri. William took the photo.



Two tables & three telescopes are set up for the public to see Jupiter, Venus, Saturn and the Moon on this hot, muggy evening.

Photo by Terri Finch.



Mike Marron with his Meteorites at Leprecon on June 26, 2015, draws a crowd during our Star Party on this evening at the Embassy Suites North. Photo by Terri.



Everyone is so intrigued by Mike's Meteorites. Photo by Terri.



Foreground: Mike's table with Meteorites. Background: PAS Handout Table with Storm talking to some attendees. Photo by Terri.



Storm at the PAS table. Kevin to the left behind the table. Rick to the right with his scope and William assisting & 2 attendees. Photo by Terri.



Mike at a table indoors on Saturday due to the Haboob that took over our evening viewing session. Photo by Terri.



Sam and his new pet Tribble on Friday evening June 26, as we are getting ready to do the star party at the Embassy Suites North. Photo by Terri.



Along the back of the photo, we have: Sam with his scope, then Kevin and his scope, Rick and his scope and Storm at the PAS Table. It was a good turnout at this event. Photo by Terri.



Two attendees looking through Kevin's scope with Kevin in the front and Sam behind him in the background. Photo by Terri.

Perseid Meteor Shower Party in Carefree Aug 12

By Terri, Event Manager

This was a fun event. In brief, we had very few meteors, but some were really awesome to see. This was a snack-only event, but many people requested to make it a dinner next time.

Weather-wise, we had some clouds get in the way earlier in the evening, but by about 11pm, it cleared up for us to see many meteors. We didn't see the predicted amount, but some of the meteors we saw, were really bright. We also had some great conversation through the evening while laying back in chairs and watching the night sky.

In attendance at this event, which was a Private PAS event, were Sam Insana, Rodney Fong, Pete Turner, Alex Vrenios, Don Boyd, Howard Moneta, Kevin Witts, Dewell Howell, William and Terri Finch, Storm Sallas, Paul Facuna, Kevin Harcey, new PAS member Sid Padgaonkar, Mark and Michelle Peterson and our host of the event, Mike Marron - a great turnout. I'd also like to welcome new member Sid Padgaonkar who joined that night to PAS! He had come to take star trail photos and had perfect weather for photography. Thanks to everyone who brought a snack to share: good but so unhealthy! Many thanks also to Mike for hosting this event. It was a fun night.

Sam writes: On the night of August 12th, about 15 people gathered at Mike's to view the Perseid Meteor Shower. We shared snacks and our sense of humor. We went outside from about 10 pm to 12 midnight to try to catch one of the best meteor shows of the year. Unfortunately there were a lot of clouds, being monsoon season. We were lucky, however, because there developed a hole in the clouds in the northeast. This allowed us to view about 20-30% of the night sky. Some of us had zero gravity

lounge chairs to recline in, saving our necks. A few also had an app on our smart-phones allowing us to set our location, recording the time, counting the meteors seen and sending the info to a university that will gather all the information to use for scientific research. I know Pete and I did this and Don had the app installed on this phone but unfortunately left it at home. Everyone chipped in by yelling out when they saw a meteor. Some of them were fireballs, all of them were very fast, and a few (about 5) were going in weird directions, not associated with the Perseids. We counted approximately 18 total meteors in the first hour and about 33 during the second hour.

Afterwards, I used a visual observation form from the International Meteor Organization to fill out required data of our observing session. I had to record our location in longitude and latitude, time of observations, our field of view consisting of a star centered in the area we were looking at (e.g. Deneb for which I had to note RA and Dec), the limiting magnitude which I calculated as 4.79 using a star field in Cygnus, and then a very rough estimate (really a wild guess) of the magnitude of each meteor. Alex spent a lot of time figuring out the IMO observing form for us and he printed up copies of this form for people to use. Nevertheless, I think I was the only person to actually fill out the form. Hopefully more PAS members will get involved in future meteor shower observing and recording.

Alex also built a large antenna and attached it to a radio. He was able to hear when meteors flew by, even those hidden by clouds. The FM signal bounced off the ionized tail of the meteor and was reflected back to his receiver. Alex was especially good at hearing the giant meteors that

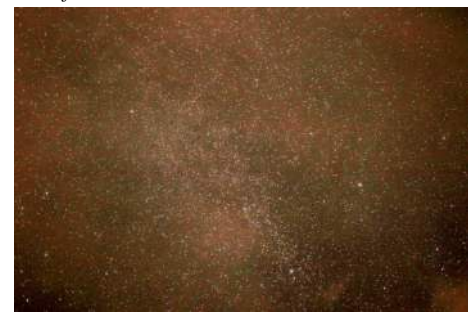
looked a lot like airplanes. We also heard mysterious baaaaaaa noises throughout the night, allowing those who fell asleep to count sheep!

We had a guest, Sid, show up who photographed the night sky over a long period of time to try to capture meteor trails. I was happy to hear that he joined PAS that night. He is also an avid birder and will be going to southeast Arizona to observe and count species he could never see in Chicago, where he used to live.

Sid writes: Thank you. I enjoyed meeting all of you and thank you for the warm hospitality.



Sid Padgaon took this photo while at Mike's Meteor Shower Party on Aug 12, 2015. He captured a Perseids' Meteor in this photo. Manual; 15 sec; f/2.8; ISO 1000 Canon 7D MkII; EF 40mm



Star Field at Mike's Meteor Shower Party in Carefree taken by new PAS Member Sid Padgaon. Manual; 15 sec; f/2.8; ISO 400 Canon 7D MkII; EF 40mm

Black Mountain Campus Star Party Sept 17

By Various Attendees

Terri Finch writes: We had lots of attendees, probably 90 percent from Meet-Up. I wish to thank the telescope team for bringing their equipment and enjoying the night with the public. My guess is we had about 80 in attendance from the public.

Attending from PAS were: Sam Insana with his 8", Howard Moneta with his 14", William and Terri Finch with handouts and Kevin Witts with his 8" with which he

showed Pluto! Paul Facuna attended to help out and Bob Ewing brought 2 scopes... the 12" Obsession that belongs to PVCC, and the 6" Refractor he has for sale. In addition to the telescope team above, we also had PAS Members Ray Adams with his scope and Bill and Beth Powell with their scope.

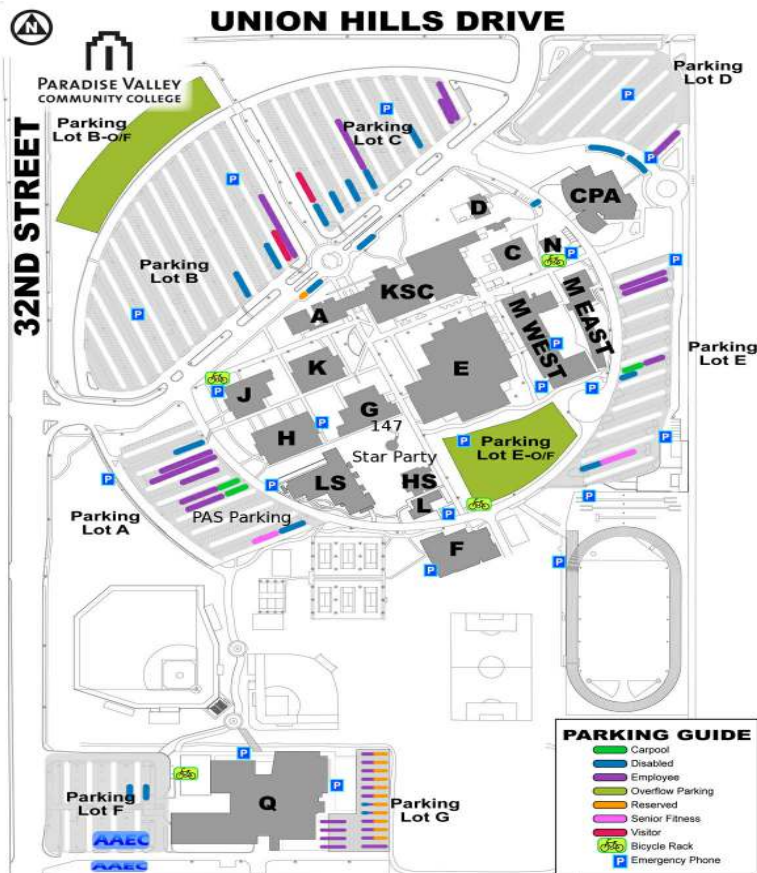
The night was clear and a bit hot, but very successful. We look forward to the

next event at BMC.

Bob Ewing writes: Wow. Thanks to all of you who attended the BMC star party last night. Great group and great crowd. Thanks for helping my students enjoy the evening.

Map of PVCC Main Location

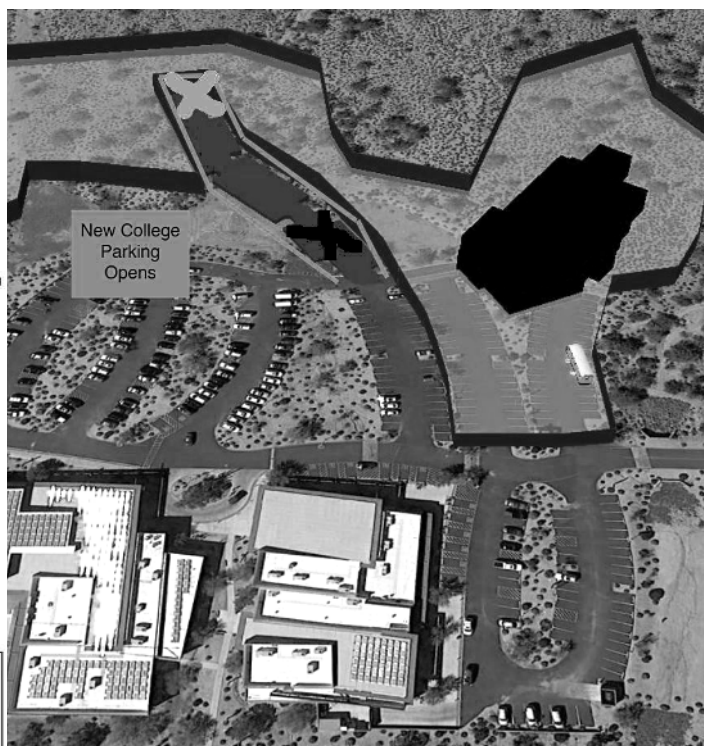
18401 N. 32nd Street | Phoenix, AZ 85032



Black Mountain Campus of PVCC

60th Street and Carefree Hwy

34250 North 60th Street, Scottsdale, AZ 85266



The white X is Scope set up. The dark X is PAS Parking.

November 2015

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 Solar Viewing in BCC	2	3	4 PAS Meeting	5 Free Lecture at PVCC Taurids Meteor Shower Peak	6 School Star Party (Private)	7
8	9	10 School Star Party (Private)	11 Private Star Party	12 Public Star Party at BMC	13 School Star Party (Private)	14
15 Free Telescope Workshop	16	17 School Star Party (Private)/ Leonids Meteor Shower Peak	18 School Star Party (Private)	19 Free Telescope Workshop	20	21 Solar Viewing at Bookmans
22	23	24	25 Backup date for Nov 11	26	27 DBG Luminaria Star Party	28 DBG Luminaria Star Party
29	30					

Don Boyd
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To:

2015 PAS GUEST SPEAKER LINE-UP

By Terri, Event Coordinator, Events@pasaz.org
Do you have an idea for a Guest Speaker? Email me the details.
Here's the scheduled Guest Speakers at PAS:
<http://www.pasaz.org/index.php?pageid=meetings>
Dec 2 (Wednesday): Astronomy Equipment Swap Meet: Bob Ewing "The
Cosmological Distance Scale"
Jan 14: Alex Vrenios: "Radio Astronomy"
Feb 4: Ted Blank: Topic: Occultation research

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What's Up For November?

By Rod Sutter, PAS Past President

Planets

Name	Date	Rise	Set
Mercury	11-15-15	06:56	17:20
Venus	11-15-15	03:24	15:19
Mars	11-15-15	02:56	15:02
Jupiter	11-15-15	01:56	14:27
Saturn	11-15-15	07:58	28:14
Uranus	11-15-15	15:35	04:15
Neptune	11-15-15	13:49	01:05
Pluto	10-15-15	10:45	20:52

All Times Arizona Time

November 15 2015

Sunrise: 06:59
Sunset: 17:25



Q3: November 03



New: November 11



Q1: November 18



Full: November 25

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