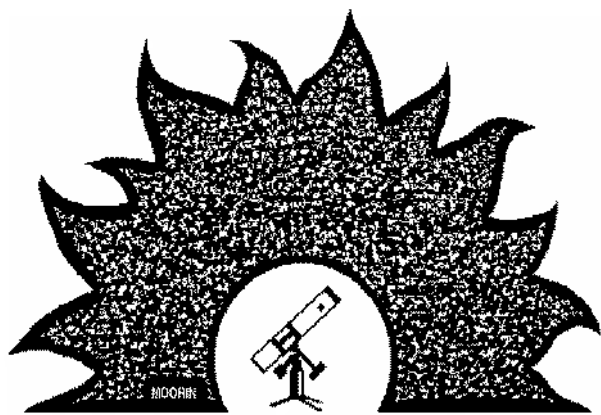




PAStimes

Phoenix Astronomical Society

www.pasaz.org

March 2017

Volume 68 Issue 7

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Dr. Andy Odell to Speak at Mar 2 Meeting

“Life and Times of the Sun and Stars”

Andy Odell studied physics and astronomy at University of Iowa under Dr. James Van Allen, then attended graduate school at Washburn Observatory at University of Wisconsin. He was an assistant professor at University of Northern Iowa, and then moved to Tucson to analyze the data from the Pioneer Venus Landing Probe. After that he moved to Flagstaff to work at Northern Arizona University, and is now retired from there, but still volunteers at the public program at Lowell Observatory which supplies him with much research telescope time.

Dr. Odell became interested in astronomy at a young age, and after realizing that stars can't live forever, was intrigued with questions about where they come from, how they live their lives, and how they die. As it turns out, answering questions simply brings up more questions, and eventually one must turn from the library to the telescope to answer them. This may seem like a losing strategy, but in fact, it is an excellent career choice. Dr. Odell will tell us what he has discovered over the years about the “Life and Times of the Sun and Stars.”



Andy Odell – Photo provided by Andy.

Dinner Prior to & the Mar 2 Meeting

By Terri, Event Manager

PAS Members are having dinner prior to this meeting at Applebee's at 4:30pm on this date. RSVP is required by the day before so that I can put in the reservation that morning. Here's the link to RSVP: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2247&day=2017-03-02>.

Please join us at this month's meeting for a presentation by Dr. Andy Odell. Bring a snack to share and/or donate what you can to the snack fund, as it is the snack fund that provides each month's bottled water. It only takes a few members to donate \$1 to cover the next month's case of water. We will be having a raffle, talking about upcoming

events (and boy, do we have upcoming events!), and more. Bring a friend and your family members to this meeting! Everyone is welcome to attend.

The meeting doors open at 7pm for setup, gathering of announcements and socializing. The meeting will begin at 7:30pm with a few very brief announcements after which Dr. Odell will begin his presentation. We hope you can attend!



Dr Andy Odell... Photo provide by Andy. Andy writes: The telescope in this photo is the 90" Haro telescope at Cananea Mexico, that I have used several times.

PAS's New Room LS-203

By Terri, Event Manager

For the remainder of the Spring 2017 Academic Semester (Feb - end of May), PAS will be meeting in a new room on the PVCC Main Campus: LS-203 which is bigger than LS-205. Many thanks to Jenny

Weitz, PAS / PVCC Liaison, for arranging for PAS to have such a nice meeting room. Make a note of this on your calendar so you remember where to find us for the PAS meetings of March 2, Apr 6 and May 11.

We hope you will attend and enjoy the many wonderful guest speakers we have lined up for this semester.

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PAS Upcoming Events in March

By Terri, 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 it is for PAS Members only or PAS SIG Members.

Mar 2: Dinner prior to the PAS Meeting will be at Applebee's at 4:30pm. Come meet the Guest Speaker. RSVP is needed the day before at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2247&day=2017-32&c=1>

Mar 2: PAS Meeting at PVCC in Room **LS 203**. Come enjoy a presentation by Alex Vrenios, PhD. Bring a snack to share. Bottled water provided by PAS snack fund. Everyone welcome. Doors open 7pm. Meeting begins 7:30pm. Here's the link for more details about this event: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2008&day=2017-32&c=1>

Mar 3: School (Private) Star Party in Goodyear. PASTimes Star Tour Members only: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2227&day=2017-33&c=1>

Mar 4: Music Jam (Private) - PAS Members Only. Potluck begins at 5:30. Jam begins at 7pm. This is a decent viewing night. See more details about a Members Only star party at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2190&day=2017-34&c=1>

Mar 6: School (Private) Star Party in

Phoenix. PAS Members Only. <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2253&day=2017-36&c=1>

Mar 9: Public Star Party for STEM - Everyone Welcome at BMC Campus for this event. Event is from 7pm to 9:45pm. RSVP is strongly requested and more details are at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2090&day=2017-39&c=1>

Mar 11: Public Star Party at Bookmans for a sidewalk astronomy event. Event is from 7pm to 10pm and RSVP is requested. Come view through our telescopes to see the Moon, Jupiter and more. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2228&day=2017-3-11>

Mar 12: 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 number 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=2019&day=2017-312&c=1>

Mar 17: School (Private) Star Party in Cave Creek. PASTimes Star Tour Members only. <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2276&day=2017-317&c=1>

Mar 18: Night Sky Training Session (Private) for PAS Members Only. This is the event everyone loves to attend to learn more about how to find stuff in the night sky. May include eyepiece and filter discussion. RSVP is required and there is a potluck before the event. More info: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2229&day=2017-318&c=1>

Mar 20: MOM's (Private) - This Meeting, this time, is for PAS Members only. A MOM's is a business meeting for club business. Details are at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2271&day=2017-320&c=1>

Mar 23: Huge public star party at PVCC Black Mountain Campus, 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=2091&day=2017-323&c=1>

Mar 24: DBG (Private) PASTimes Star Tour members only <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2230&day=2017-324&c=1>

Mar 25: Messier Marathon (Private) PAS members only. This event has a potluck prior to the start of the event. More

details:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2231&day=2017-3-25&c=1>

Mar 30: Huge Star Party at ASU West at 47th Ave and Thunderbird Road. Come view through our advanced telescopes: Venus, Mars, Saturn and we might catch seeing

the ISS fly over on this night. Event is from 6:30 to 9pm. RSVP is with Paul. More details are at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2224&day=2017-3-30&c=1>

Mar 30: Dinner prior to ASU West Star party at 4:30. RSVP is requested at this link:

<http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2282&day=2017-03-30>

Mar 31: School (Private) Star Party in Mesa. PAStimes Star Tour members only. More details: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2232&day=2017-3-31&c=1> ***

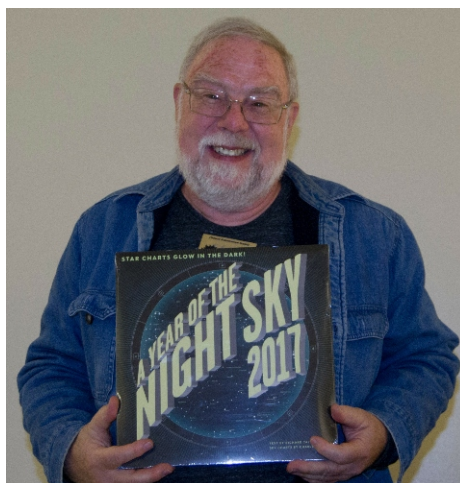
Feb 2 PAS Meeting

By Terri, Event Manager

The meeting opened at 7:35pm with President Sam introducing the new attendees and officers of PAS.

Alex then took the floor and did a well thought out presentation about radio astronomy with lots of audience participation. Thank you Alex - this talk was well worth the wait after being rescheduled from last year. We noticed that we had quite a few radio astronomy guests at this meeting who engaged in interesting dialogue with Sam and Alex. Alex's talk went to about 9:10, after which, Leah announced the acquisition of the DVD Astronomy Series she had ordered per the club vote. Each DVD is 3 hours long with 6 - 30 minute classes. The DVD's were put into my care and once I find jewel cases for them, I will be lending them out, library-fashion to PAS members who wish to borrow them. Our hope is that the borrowed DVD's will come back to me prior to the following PAS Meeting so the next PAS Member may borrow them. One DVD at a time will be lent out. If anyone has them, I'm looking for empty jewel cases to hold single DVD's for lending.

Bill Powell, the leader of the Spectroscopy SIG within PAS, talked about the meeting the Spectroscopy SIG just held and



Mike was presented with a gift at the February 2nd meeting for hosting the 2017 PAS Social which will happen on April 15th. The Finches purchased it but it is considered from all who will attend the Social this year, and it had to be delivered early since it is a 2017 Glow in the Dark Calendar. Photo by Don.

how successful it was. Mike Marron announced his upcoming Feb 6 presentation "Earth Shattering Evolution." The talk is Mensa but is open to PAS members. Sam talked about putting in another order with Infini-Tees for shirts, jackets, hats, bags, etc. The meeting concluded about 9:40pm.

We had a number of new faces at this meeting along with the return members. Welcome new member David Oyler who joined at the meeting. Bill won the Raffle this month. Hope to see everyone at the March PAS Meeting and possibly the dinner at Applebee's prior to the meeting (RSVP is required for dinner by day before, so I can make the reservation that morning).



Dr. Alex Vrenios at February Meeting presenting on "Radio Astronomy" Photo by Don.

Solar Event for Lori's Class at BMC Feb 8

By Mark Johnston

On Feb 8th I ran a private volunteer solar event for PVCC at the BMC campus. Lori (the astronomy instructor) and about 15 of her students attended. Using my Lunt solar telescope, we were able to view the Sun in hydrogen alpha and see several prominences including one loop prominence. Also visible were several filaments and a bright sunspot region.

Some of the students took a little while to get used to looking through the telescope but eventually all were able to spot the prominences. We had a good discussion about how the Sun works and the (unfortunate) fate of the Earth in a few billion years. I did some general astronomy Q&A and encouraged them to attend future evening PVCC star party events put on by PAS.



Mark provided this photo of a student at BMC in Lori's class viewing through Mark's Solar Scope at the Feb 8 Solar Event.

PRESIDENT'S CORNER

By President Sam Insana



PAS President Sam Insana. Photo by Terri

One of our newer members contacted me and said he wants to learn as much as possible about his telescope, planning a

stargazing session, learning the night sky, learning what eyepieces to use, learning about what filters to use, how to collimate and more. Because of his age, he doesn't want to take years to learn all this but would like to become proficient in less than a year. He had a great idea, suggesting that we start a mentoring program. He would like to join one of our seasoned veterans and spend an hour or so with him or her and see everything that is done, followed by another night, maybe with a different PAS veteran. I told him I could help him at the next telescope workshop for an hour and then spend another hour with him at the next star party. Finally I suggested spending a third

hour with me or another PAS veteran at the next night sky training session. After 3 such mentoring sessions, he should be much further along than if he just read astronomy books and magazines, attended lectures, and struggled on his own. Actually, I am still learning something new every time out, even though I have been doing this 32 years. I believe however, that I could have become much better much faster if I had been a student under a mentor early on. If other PAS members want to be placed with a mentor, contact me and I can try to make arrangements for someone to work with you in the field.

The PAS Music Jam will be on March 4

By Terri, Event Manager

Based on an idea a number of years ago from John Pulis (RIP), PAS held a "music jam". Everyone really enjoyed it, so we decided to make it an annual event.

Playing an instrument: If you know how to play music, either by sight reading or by ear, drop an RSVP into the calendar listing for this event at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2191&day=2017-3-4&c=2> and mention what instrument you will be bringing or whether you are doing rhythm, singing or just listening. We invite all PAS Members to attend. You can also borrow a tambourine or bring your own. Please no drums - it just doesn't fit in the living room space we are setting up our jam in. We prefer mostly acoustic instruments, but if you bring something electronic, please keep the volume to a reasonable level. Come make music with us! You don't have to know how to play to enjoy the jam. The music books for which we will be playing from are being provided by Ed Wurst, so you must RSVP to have a book to use.

The potluck will be at 5:30pm. Try to arrive 10 or 15 minutes prior to the start of the potluck. We ask that you bring a main dish with enough to feed your attending party plus one. To avoid duplicates, all PAS members are asked to go to Perfect Potluck at the link provided here, and sign up with your main dish and the drink you are bringing (no alcohol) to share. Additional items can be brought as well, as they are requested and listed in Perfect Potluck. The link is in the Private Forums here:

<http://www.pasaz.org/forums/showthread.php?t=1128>

Attendance: This is a members-only event, so please no guests. Please list everyone attending in your RSVP on the PAS Calendar.

Movie: After the jam, which has been 2 to 3 hours in length in the past, we may stick around to watch a movie. All the details and any changes will be in the PAS Private Calendar, at the link above and in the Private Forums with members-only access.

Star Gazing this evening: This date also lends itself to a decent viewing evening. It won't be super dark as the Moon is going to be 1 day shy of 1st quarter phase, however, visible this night could be the Moon, Venus, Orion Nebula, Mars, the HST, Uranus and Jupiter. Here's the link with more exact details of what we might see this night: <http://www.pasaz.org/forums/showthread.php?p=2952#post2952>.



PAS Music Jam of Jan 3, 2015. (L to R) Terri on Flute & Keyboard, Eric on Recorder & Bass Guitar, Sam on Trumpet & Keyboard.

Photo taken by William Finch.

<http://www.pasaz.org/forums/showthread.php?p=2952#post2952>. So, if you wish to bring along your telescope, feel free to set up at the back of the house and share the night sky with the attendees. Those playing in the jam can view through the telescopes after it ends. In the RSVP, please let me know you need access to parking at the back of the house to set up your telescope. We will reserve the back of the house for telescope parking only, unless no one attends with their telescope. So, be sure I know, in the RSVP, what your plans are for that night's attendance.

PAS Messier Marathon 2017

By Terri, Event Manager

PAS will be holding its Messier Marathon on the evening of Mar 25. This will be a private viewing event for PAS members only. Bring the whole family and make a party of it.

Potluck will begin at 5pm. Bring a main dish and a drink to share so we have a hearty meal to last us through the night. Those needing to sleep can just inform the host of the party - you are welcome to do so in the living room.

Those doing the marathon should be sure to let the rest of us know not to bother you while you compete. The rest of the attending members and families can view

through additional telescopes set up for viewing. The Moon will set before the Sun on this night and will not be seen again until 5:30am. Those doing the Messier Marathon should go as far back away from the house as possible to keep away from the lights.

The highlights for those attending to look through the scopes but not compete in the marathon could include: Mars, Orion Nebula, Jupiter, the ISS at 8:25pm and Pleiades. More details about what objects we may see this night, can be found at this location:

<http://www.pasaz.org/forums/showthread.php?p=2954#post2954>

Certificates provided by PAS will be given at the awards ceremony on Apr 27. Be sure to report your total observed objects to Terri prior to April 1st so you can be included in the awards. Any number of objects, of the 110 possible, gets you a certificate of completion. If you make it near 110 objects, talk to Eric, Treasurer about an award from the Astronomical League. Let's see how many Messier objects we can see on this one night! Good luck to all who are competing! See you at this event! RSVP at this link: <http://www.pasaz.org/forums/calendar.php?do=getinfo&e=2283&day=2017-3-25>

A Slew of Fun Upcoming Events in 2017

By Terri Finch, Events Manager

For more events: <http://www.pasaz.org/forums/calendar.php>

Pull out your calendar and put these events into your schedule. These are the events that are really fun for everyone involved - you don't want to miss them. Some events are private, PAS members-only (you need to join prior to attending).

Spring 2017 we have:

Mar 4 PAS Music Jam - PAS Members Only

Mar 9 Black Mountain Campus Star Party - Everyone Welcome

Mar 11 Bookmans Sidewalk Astronomy - Everyone Welcome

Mar 18 Night Sky Training Session - PAS Members Only

Mar 23 Black Mountain Campus Star Party - Everyone Welcome

Mar 25 PAS Messier Marathon - PAS Members Only

Apr 8 Bookmans Sidewalk Astronomy - Everyone Welcome

Apr 15 PAS Social - PAS Members Only

Apr 20 Black Mountain Campus Star Party - Everyone Welcome

Apr 22 Binocular Star Party - PAS Members Only

Apr 27 PAS Awards Ceremony - PAS Members Only

May 4 Black Mountain Campus Star Party - Everyone Welcome

May 6 Bookmans Sidewalk Astronomy - Everyone Welcome

May 20 Mike's Birthday Party plus a dark sky star party - PAS Members Only

Summer 2017 we have:

June 3 Bookmans Sidewalk Astronomy - Everyone Welcome

July 8 Bookmans Sidewalk Astronomy - Everyone Welcome

Aug 5 Bookmans Sidewalk Astronomy - Everyone Welcome

And a few Fall 2017 Events to note:

Sept 14 Black Mountain Campus Star Party - Everyone Welcome

Sept 30 Astronomy Day at a local park - Everyone Welcome

Oct 19 Black Mountain Campus Star Party - Everyone Welcome

Oct 21 Orionid Meteor Shower Party in Carefree, Dark Sky star party

Oct 28 PAS Halloween Party - PAS Members Only

Nov 9 Black Mountain Campus Star Party - Everyone Welcome

I didn't list the PAS Meetings or the Telescope Workshops, but there are plenty of those events as well throughout 2017. New events are being added to the PAS Calendar all the time. Hope to see you at these fun events!

Sci-Fi Movie Trivia:

Gravity (2013) - The film's cascade of debris is a very real possibility. This scenario is known as the Kessler syndrome, named after N.A.S.A. scientist Donald J.

Kessler who first proposed the theory in 1978. A cascading Kessler syndrome involving an object the size of the International Space Station would trigger a

catastrophic chain-reaction of debris. The orbiting debris field would make it impossible to launch space exploration missions or satellites for many decades.

For Sale:

Meade 8" LX200®R Advanced Ritchey-Chretien Telescope, Asking \$1500.00, package deal only. Please contact Dave at

dschumann2014@yahoo.com / Phone 520-559-1223. Pick up location is Whetstone AZ. I can email pictures at your request. Please see full

ad for this scope in January 2017 issue of PAS-times on the top of page 8.

8" Orion dob. Gently used, always cared for. 2" focuser, red dot finder, 1.25"-2" eyepiece adapter. Comes with an Orion soft carrying bag for the optical tube. \$425 OBO Contact Terry 602-703-3772 or tdancer1986@gmail.com

Bookmans Telescope Workshop Nov 20

By Alex Vrenios

Among the attendees were a man, his wife and their friend, who just moved here from the San Francisco area where light levels and weather conditions pretty much prevented any astronomical observation. Now that they are settled into their new home north of Phoenix, they all want to get into the hobby. We discussed the types of telescopes and their plusses and minuses, the costs of the various types and the hassle associated with trying to transport a large scope. The bottom line, as we explained, is to come to our star parties, look through the variety of telescopes and see which ones

they might be interested in buying for themselves. They joined our club and will likely start doing just that! Another man came in with a 4.5" Newtonian on an older manual equatorial mount. Sam, got it assembled and helped him figure out how to use it properly.

Terri, Event Manager adds: In attendance from PAS to help at this event were these PAS Members: William and Terri Finch, Rodney Fong, Alex Vrenios, Sam Insana, Don Boyd, Bruce, Ed and Bette Wurst, and Mike Marron. Attending to find

out about their telescopes were Gene with his Celestron FirstScope 114 whom Sam assisted, along with Matt who came to find out what to purchase.

After the event, there were 17 in attendance at the birthday party for Storm Sallas and the 59th anniversary of Ed and Bette Wurst were: Ed, Bette, Bruce, William, Terri, Rob, Terri (Rob's mom), LaDien, Tim, Donna, Helen, Sam, Alex, Diane, Don, Mike and Rodney. Many thanks to Daniel, our waiter at Carlos O Briens for taking great care of everyone.

Telescope Workshop Dec 15

By President Sam Insana

try it out at the next star party.

Astronomy professor Jenny Weitz, our PAS/PVCC Liaison, spent the evening with us. For the last 30 minutes Leah led a discussion about a great idea she has for people to drive in a caravan from Denver to Scottsbluff, Nebraska the night before the August 21st total solar eclipse. Participants would then carpool the last several miles to the center line. I pointed out that I will be sending weather forecasts every day during

Although it was cloudy, cold and threatening rain, PAS held the telescope workshop at PVCC on Dec 15th. We stayed inside and accomplished quite a bit. Alex Vrenios and Don Boyd helped Ashk

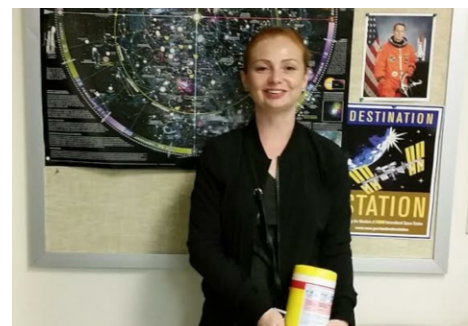
with his 8 inch Celestron SCT. It turned out to have several problems that will probably be expensive to correct. It may be better to buy a newer one which they have on sale for \$1000 rather than spend hundreds on a 15 year old scope that had been left outdoors in various climates. We directed him to give Bruce a call to see what he might charge to make fix the problems.

George Zukaukas spent 2 hours with Leah Sapir learning various ways to star hop and find all kinds of celestial objects. Leah was thorough and George can't wait to



Alex and Don teaching Ashk about his Celestron Nexstar 8",

Photo by Sam.



Jenny Weitz was at this Telescope Workshop.

Photo by Sam Insana.

the last 10 days to see if we need to do a last minute change in plans. Don looks like he may drive from Phoenix - it would be nice if someone else would carpool with him. Rodney Fong helped at this event by searching the PVCC campus for one of our lost class attendees, finding him and bringing him to our workshop.

Family Reunion Star Party Dec 28

By Mark Johnston

bles), the double cluster, M31, the Orion Nebula with the trapezium, M35 in Gemini, the double double in Lyra, the Pleiades, and finished up with the Owl Cluster.

They were a very inquisitive bunch, with questions ranging from how the Sun formed, to how old the universe was, whether there was life outside the Earth, next summer's eclipse, how long it would take to travel to Proxima Centauri, the distance to various objects and what is a supernova, a neutron star and a black hole. Kept

On December 28, I supported a family reunion event in Carefree. It was a good location just off a parking lot in a cleared section of the desert, very dark with unobstructed views in all directions. There were about 20 attendees, all related (family), from a 5 year old girl to an 83 year old grandmother.

I set up at 6 and we got started about 6:45. I showed them Venus (nice 'half moon' shape), Mars (polar cap still visible), Albireo and Eta Cass (nice colorful dou-

me talking the entire evening!

By 8:15 many of them were getting cold and some high clouds that had persisted on the western horizon were finally moving in so they were ready to wrap it up. Many of them thanked me as they left and most seemed very interested based on their comments at the eyepiece and the blizzard of questions I received. It was a good evening all around!



The Closest New Stars To Earth

By Ethan Siegel

When you think about the new stars forming in the Milky Way, you probably think of the giant star-forming regions like the Orion Nebula, containing thousands of new stars with light so bright it's visible to the naked eye. At over 400 parsecs (1,300 light years) distant, it's one of the most spectacular sights in the night sky, and the vast majority of the light from galaxies originates from nebulae like this one. But its great luminosity and relative proximity makes it easy to overlook the fact that there are a slew of much closer star-forming regions than the Orion Nebula; they're just much, much fainter.

If you get a collapsing molecular cloud many hundreds of thousands (or more) times the mass of our sun, you'll get a nebula like Orion. But if your cloud is only a few thousand times the sun's mass, it's going to be much fainter. In most instances,

the clumps of matter within will grow slowly, the neutral matter will block more light than it reflects or emits, and only a tiny fraction of the stars that form—the most massive, brightest ones—will be visible at all. Between just 400 and 500 light years away are the closest such regions to Earth: the molecular clouds in the constellations of Chamaeleon and Corona Australis. Along with the Lupus molecular clouds (about 600 light years distant), these dark, light-blocking patches are virtually unknown to most sky watchers in the northern hemisphere, as they're all southern hemisphere objects.

In visible light, these clouds appear predominantly as dark patches, obscuring and reddening the light of background stars. In the infrared, though, the gas glows brilliantly as it forms new stars inside. Combined near-infrared and visible light

observations, such as those taken by the Hubble Space Telescope, can reveal the structure of the clouds as well as the young stars inside. In the Chamaeleon cloud, for example, there are between 200 and 300 new stars, including over 100 X-ray sources (between the Chamaeleon I and II clouds), approximately 50 T-Tauri stars and just a couple of massive, B-class stars. There's a third dark, molecular cloud (Chamaeleon III) that has not yet formed any stars at all.

While the majority of new stars form in large molecular clouds, the closest new stars form in much smaller, more abundant ones. As we reach out to the most distant quasars and galaxies in the universe, remember that there are still star-forming mysteries to be solved right here in our own backyard.



Image credit: NASA and ESA Hubble Space Telescope. Acknowledgements: Kevin Luhman (Pennsylvania State University), and Judy Schmidt, of the Chamaeleon cloud and a newly-forming star within it—HH 909A—emitting narrow streams of gas from its poles.

Sci-Fi Movie Trivia:

Total Recall (1990) - Although the specific location of Mars City on the planet's surface is never mentioned, the fact that many of the habitable structures are built on the sides of a massive canyon could lead one to sufficiently assume that Mars City is located along a section of the Valles Marineris canyon near the Martian equator. Valles Marineris is a massive canyon that

stretches over 2500 miles, many times longer than any canyon on Earth. The idea for having the structures built along canyon walls was taken from information gathered by production designer William Sandell when he traveled to various universities to find out how one might go about living on another world (as well as gather ideas for the sets), and a popular idea was to build

structures half-inside rocks to protect from solar radiation.

Conquest Of Space (1955) - The spaceship design was taken from Wernher von Braun's actual designs that appeared in a 1954 issue of Collier's.

SpaceCamp (1986) - The interior of the Space Shuttle Atlantis was filmed in the Atlantis simulator at the real Space Camp.

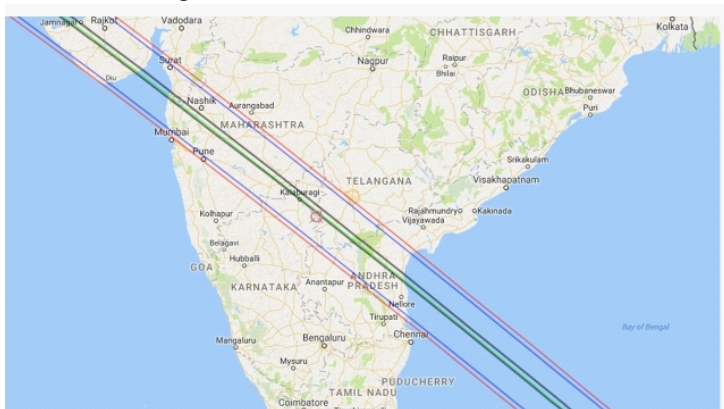
ASTRONOMY ADVENTURE IN INDIA

By Paul D. Maley

At PAS we have talked about the scientific importance of observing asteroid occultations. A good opportunity to observe an eclipse of a 9.2 magnitude star by the Main Belt Asteroid (22) Kalliope occurred on Christmas Day in western India. My wife and I flew to Mumbai and then went by taxi for 3+ hours to the city of Pune (population 5 million) which served as our base of operations. We spent 3 nights at the JW Marriott Hotel planning and working with local amateur astronomers of the JVP, Jyotirvidya Parisanstha, which is India's oldest amateur astronomical society, CCS (Center for Citizen Science) and the Nehru Planetarium in Mumbai.

I had been working with Suhas Gurjar, the local coordinator, for more than a year since our last trip to India October 3, 2015 where we successfully observed an asteroid occultation near Delhi airport at Damdama Lake through heavy air pollution, running wild pigs, motorcycles, cars, unexpected passing people and fires, and fireworks. Despite all of this our group of 8 persons saw the occultation and timed it in 2015.

This time the occultation track was about 180 km wide moving northwest to southeast across the country as shown below. Luckily it occurred in a good weather month.



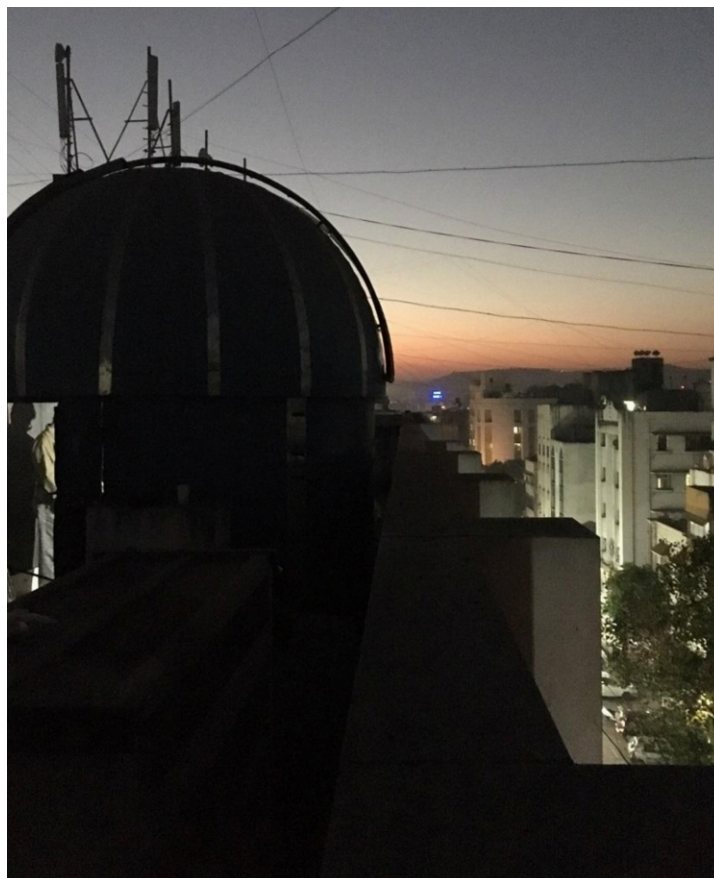
Kalliope occultation path.

I was invited to present a one hour colloquium on occultations at the Inter Center University for Astronomy & Astrophysics on Dec. 22 which 80 people attended. The next night the JVP group set up at their downtown observatory to practice finding the star to be occulted and where I provided training to all team members.



Center for Citizen Science observing session under dark night skies

Amateurs in general have access to 4 and 6 inch telescopes that are manually pointed. Some are Dobsonians but there are also some reflectors on clock driven mounts.



Kesariwada Jyotirvidya Observatory in downtown Pune at sunset. It houses an 8-inch scope.

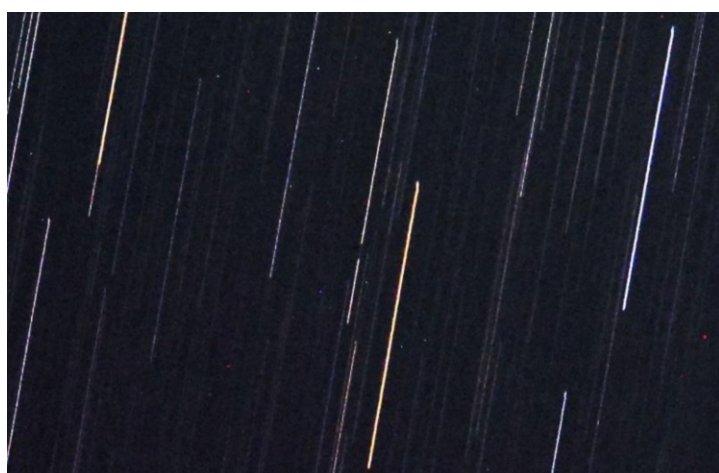
All observers were amateur volunteers who were students at either the university or high school level. Many were young girls. One was so skilled she recognized an obscure star pattern on one of my star charts as those stars appeared on the tiny camcorder screen.



Training local amateurs in the use of my equipment with JVP club members

I had brought eight sets of 80mm refractors and video gear for use by 16 team members at different locations across the path. On Christmas Eve Day we set out at 2:30 pm in order to avoid terrible traffic jams due to expected arrival that afternoon of the Indian prime minister. The team converged at a petrol station at 6pm where the first site was laid out. Over the next seven hours we traveled across the path setting up each telescope and dropping off team after team. We also were witness to two traffic accidents. The sky was severe clear. I set up at the last site about 30 minutes before the 3:26 am occultation time on Christmas Day and was barely able to find one or two recognizable stars due to a defective camera. I took a wild guess and by sheer luck happened to have the star pass right through the field of view at the correct time. In fact, all eight stations were successful.

About 10 additional sites were set up interspersed with ours where people visually observed rather than used video systems. There were a few problems but most stations did log data.



The occultation is seen as the short break in the central line recorded by 35mm camera some 8.3 sec long



Some of the volunteers from the Center for Citizen Science in Pune

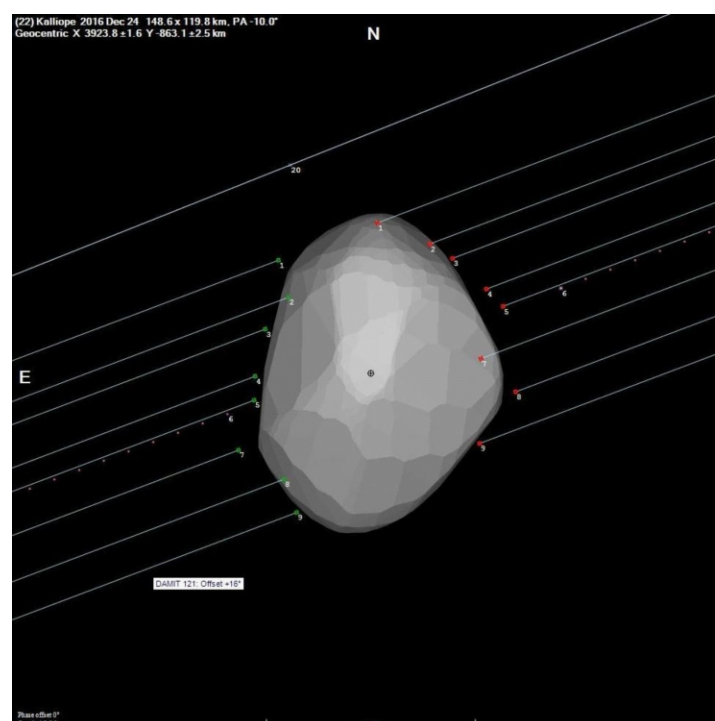
The young people I met were extremely excited about this event which may serve as a catalyst for future work in India along these lines. Occultations had been observed years earlier in India but never by such a large group of volunteers. Overall approximately 50 observers and assistants attempted to record the occultation using either my video gear or with their own telescopes, recording it by Android phone using the app called "Time The Sat".



The pillion is a common form of transport in India

Getting to and from the occultation sites was challenging. Roads are generally terrible as they are crowded day and night. People drive with bright lights on (there are usually no street lights along highways) or they have one headlight on, no tail lights visible, drive the wrong way along the side of the road in the direction you are traveling. There was one unfortunate incident: the Mumbai organizer was riding a pillion (example photo shown above) to the occultation with a local friend going from one station to another. They were hit perpendicularly by a speeding car at a T junction with headlights off. Fortunately both the rider and organizer saw the car just in time. Both of them were thrown a few feet away from their motor bike. The organizer landed on his right shoulder and saved his head from a fatal injury. The driver of the two wheeler escaped minor injuries and also his bike was operating well enough to take them back to the city. The organizer ended up having a bruised elbow, palm etc. and severe body pain.

Despite this there were numerous successes but three stations near the coast were fogged out.



The above graphic of my 8 video stations shows how well they fit the currently known inversion model of the asteroid. More work will need to be done to incorporate the visual observations.

I did not get back to the hotel until 19 hours later, just in time to sleep two hours, pack and get a taxi back to Mumbai. I had planned my return flight to depart at night and arrive in Newark just before dawn. The good planning paid off as I had booked our seats on the right side of the aircraft. About 40% of the way through the 16 hour flight the Northern Lights turned on. This happened as we flew over the Barents Sea between Novaya Zemlya (Russian territory) and Svalbard (where we observed the March 2015 total solar eclipse). We had good views of the curtains and bands as the lights formed, faded, reformed in different parts of the sky, extended over the top of the airplane to the other side changing from white to green over a 2-3 hour period - simply beautiful. This was my 4th aurora viewing experience from planned airplane tracks. I could not take aurora photos as I was loaded to the max with carry-on luggage for the occultation. However, I did take the photo to the right on my last trip.



Hand-held shot of aurora through airplane window over Siberia by Paul Maley in 2015.

Bookmans Telescope Workshop Feb 12

By Terri Finch, Event Manager

From PAS we had: Rodney, Leah, Alex, William, Don and me as teachers. From the public we had: Bill and Jean Manny, Nyla, Lois P (with three family members), Linda M, Christine Fowler and family, Phil and Max, plus Jeff and two others. It was a crowd but it was lots of fun and everyone seemed to leave happy. While we still were setting up, the first class attendees showed up. Christine, her husband Phil and son Max came with their TwinStar Astromark 80mm scope. They were assisted by Don and Leah. A walk in, Jeff came over and listened in as William assisted Bill and Jean with their StarMaster 4.5 Refractor. We also had Lois P, her daughter, son-in-law and their young son with their Orion 10033 Funscope. Alex assisted them on this day. I asked Jeff along with Nyla Murphy to come over to the PAS table so we could talk. Jeff was explaining about how he has his heart set on a 9.25" scope. After we spoke about the pros and cons, he went over to listen to Rodney assisting another family with their scope. Leah took on a group and helped them learn what resources are out there for learning to use a telescope. Nyla, who wants to be a volunteer for PAS and help out at events, asked me about what type of scope would fit her needs. We talked about telescopes and eyepieces and I showed her examples. William finished helping Bill and also turned his attention to the conversation at the PAS table where Don, Alex and Rodney were chatting with us and giving Nyla advice. Nyla left about 5pm with Bill and Jean staying a little while to talk. It was a very busy night and there were definitely some great people at the event. Welcome new PAS members Bill and Jean! Looking forward to the next event. Many thanks to Rodney for helping set up and put away the tables and chairs for this event. This month the telescope teachers did not go to dinner after the event, but plan to go to Carlos O Brien's next month. See you there!!!

March 15 2017

Sunrise: 06:38

Sunset: 1:36

What's Up For March?

By Rod Sutter

Planets

Name	Date	Rise	Set
Mercury	03-15-17	07:04	19:12
Venus	03-15-17	06:45	19:52
Mars	03-15-17	08:23	21:38
Jupiter	03-15-17	20:28	07:59
Saturn	03-15-17	01:43	11:43
Uranus	03-15-17	07:55	20:43
Neptune	03-15-17	06:08	17:31
Pluto	03-15-17	03:14	13:20

All Times Arizona Time

Bolded dates and times are nighttime objects

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Q1: March 5



Full: March 12



Q3: March 20



New: March 27

Bookmans Telescope Workshop Jan 15

By Terri, Event Manager

It was a very busy workshop with 10 RSVP's and 2 walk-ins. We had a good-sized and much appreciated group of PAS Members to assist. Attending from PAS were: Leah Sapir, Rodney Fong, Alex Vrenios, William and Terri Finch, Sam Insana, Don Boyd, Bruce Wurst and Mark Johnston. Attending from the public were Sally and Michael with their Meade ETX 80, Richard with his Orion StarSeeker, Phil with his Celestron 93007A (assisted by Sam), Ashely and Allison with their Celestron Inspire 90AZ (assisted by Leah and Mark), Jeremy with his scope (helped by Mark), Patrick with his Celestron Cosmos scope (helped by Alex), Carlos with his National Geographic (assisted by William and Sam) and Tim with his 50600 telescope. Nina was a walk in whom Bruce assisted as were Mike and Joe who were helped by Sam. The event ran from about 3:15pm to 4:30pm, with some public attendees sticking around a little while before departing. Thanks to the whole telescope team. Ed and Bette Wurst were also in attendance at this event.

After the event, a small group of 4 PAS Members enjoyed dinner at Carlos O'Briens.



Here we have Alex assisting this gentleman with his scope and in the background is William helping another attendee. Photo by Bruce.



Sam is seen assisting a Gentleman and his son at the Bookmans Telescope Workshop on Jan 15. In the background we can see Alex helping another attendee of this class. Photo by Bruce Wurst.



It was a wonderful event with 10 attendees with telescopes who all showed up about the same time. Luckily, from PAS, we had a bunch of great Telescope Teachers available to assist at this event. Photo by Bruce.

Black Mountain Campus Public Star Party Jan 26

By President Sam Insana

PAS provided 10 telescopes for the Black Mountain PVCC star party on January 26th. Howard Moneta, Peter Turner, Leah Sapir, Ray Adams, George Zukauckas, Earl DeLong, Mark Johnston, Bill Powell, Mike Cawley, and Frank Insana provided views of the Orion Nebula, Andromeda Galaxy, Venus, M81 and M82 Galaxies, M38 open cluster, Perseus double cluster, and a few other heavenly delights. The approximately 30 customers who attended were very pleased by the telescopic sights and the meteorite presentation by Mike. Mark provided us with information on the International Space Station so we were able to tell the customers when to look up and see it cross the sky. Sam assisted Frank with his 16 inch telescope, and Paul helped guide the vehicles on and off the observational platform. Mike passed around a birthday card for PAS members to sign for Frank. The card was a humorous play on words for birders. The crowd was unusually small. Perhaps the very cold temperatures, and the partially cloudy skies

scared off some of the people. There were no customers after 9 pm, so we started to pack up at 9:15 pm (30 minutes early) and the last PAS people left the area by 10 pm.

Bill Powell writes: Cold and a little cloudy for most of the evening. A persistent breeze kept things cool. Visitors thinned out about 9:00pm but they all seemed happy about the session. The International Space Station was visible (WSW to ESE) just after 7:00pm and at the same time an iridium satellite flare was observed. Both were predicted and arrived pretty much on time.



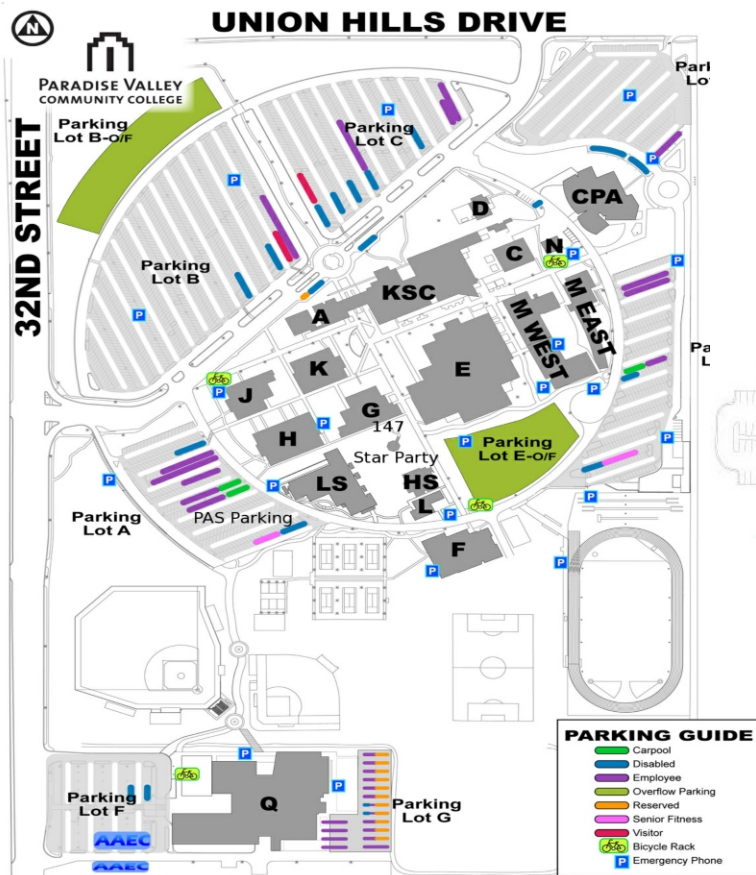
Howard, Mark, & Frank were seen at this event. Photo taken by Sam Insana.



Several PAS Members attended this star party with their telescopes. They set up on the Observing Deck provided to PAS by PVCC BMC. Photo by Sam.

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



2017 PAS GUEST SPEAKER LINE-UP

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

PAS Meetings are held on Thursdays in Room LS-205 unless otherwise noted. Do you have an idea for a guest speaker? Email Terri the details. Here are the scheduled guest speakers at PAS:

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

Apr 6: Harrison Smith "Potential Life on Exoplanets"

May 11: TBA

---- Summer Break ----

Sept 7: Member and Guest Night - Sign up with Sam to do a 5 - 40 minute presentation. President@pasaz.org ***

March 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2 <i>Dinner and Meeting</i>	3 <i>School (Private)</i>	4 <i>Music Jam (Private)</i>
5	6 <i>School (Private)</i>	7	8	9 <i>Public Star Party</i>	10	11 <i>Public Star Party</i>
12 <i>Telescope Workshop</i>	13	14	15	16	17 <i>School (Private)</i> St. Patrick's Day	18 <i>NSTS (Private)</i>
19	20 <i>MOM (Private)</i>	21	22	23 <i>Public Star Party</i>	24 <i>DBG (Private)</i>	25 <i>Messier Marathon (Private)</i>
26	27	28	29	30 <i>Public Star Party</i>	31 <i>School (Private)</i>	