

PAStimes

Phoenix Astronomical Society

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PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Variety at the February 2014 Meeting, Meeting in LS-109.

By Terri, Event Coordinator

We have an awesome meeting lined up for this month. We have 2 guest speakers who will be sharing astronomical information with us. I'd like to thank these two PAS members for doing their presentations.

Earl DeLong will be presenting "The Compton Gamma Ray Observatory," and Eric Steinberg will present "The Astronomical Unit and how we know what it is."

Invite everyone you know to this meeting!

At the meeting, we like to have snacks. So, bring a snack to share. President Bruce will provide the bottled water. We will have a Magazine Swap and an Astronomy Book Swap at the back of the room, near the snacks. Bring something to swap. We look forward to seeing you there!

There's more happening at the Febru-

ary Meeting that you will not want to miss. We are having a Silent Auction at a table off to the side of the room, look for the sign on the wall, of 4 original Life Magazine issues from June 6, 1969, July 4, 1969, July 25, 1969, Aug 8, 1969. All are in "FAIR" condition. Proceeds go to PAS. \$5 reserve per issue and 10% off if all are won by the same bidder.§

January PAS Meeting

By Terri, with help from Jenny Weitz

Due to a mishap in scheduling & communication, we had no meeting location for our January PAS meeting. Jenny writes: "I am so sorry, but PVCC has to cancel tonight's meeting. Even though the campus

was open today, security has the buildings locked down at 5PM and require someone with a pass to open the doors and be present."

The good news is, the Guest Speakers

for January's meeting, have agreed to do the February meeting. So anyone not wanting to miss those awesome topics will get the chance to see them at the February meeting.§

Awesome PAS Events Happening in 2014

By Terri, Event Coordinator Events@pasaz.org

PAS Meetings: Feb 6, Mar 6, Apr 3, May 1, Sept 4, Oct 2, Nov 6, & Dec 4.

Telescope Workshops: Feb 16, Feb 20, Mar 16, Apr 10, Apr 13, May 11, May 22, June 8, July 13, Aug 10, Sept 7, Sept 25,

Oct 5, Oct 16, Nov 9, Nov 13, Dec 7, and Dec 18.

Black Mountain Campus: Feb 27, Mar 20, May 29, Sept 18, Oct 23, Nov 20, and Dec 11.

Special Events: NSTS Mar 22, Messier Marathon Mar 29, Awards Ceremony Apr 24, Astronomy Day May 10, Fireworks party July 3, NSTS Sept 20, Astro day Oct 4, and Music Jam Dec 13.§

In Memoriam: John Dobson (1915 - 2014)

It is with heavy hearts that we must report the passing of John Dobson. He died peacefully this morning, Wednesday, January 15th, in Burbank, California. He was 98 years old. He leaves behind a son, numer-

ous close friends, and fans and admirers worldwide.

On March 8th, in honor of John, this year's ISAN (International Sidewalk Astronomy Night) will be dedicated to his memory. Amateur astronomers around the

globe can join in and celebrate John's life and continue to carry the torch that he lit back in 1968 when he co-founded the San Francisco Sidewalk Astronomers.§

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February 2014 Upcoming PAS Events

By Terri, Event Coordinator

To RSVP: Events@pasaz.org

This month has lots of School Events!

Feb 1: (Private) Star Party for School. RSVP is filled.

Feb 3: CTCA (private). RSVP is with Joe. PAS Star Tour Members Only.

Feb 4: (Private) Star Party for School. RSVP is filled.

Feb 6: PAS Meeting 7pm to 10pm PVCC Main Campus LS-109. Bring a snack to share. Water provided by President Bruce. Bring a friend! Everyone welcome!

Feb 7: (Private) Star Party for School. RSVP is filled.

Feb 12: (Private) Star Party for School.

Need more scopes, PAStimes Star Tour Members Only.

Feb 16: Bookmans FREE Telescope Workshop. Everyone Welcome. Meet in the front window of Bookmans at 19h Ave & Northern Ave in Phoenix from 3:30 to 5:30. Bring your telescope, accessories, something to write on and questions. RSVP is required with Terri at Events@pasaz.org. When you RSVP, include the make & model of your telescope.

Feb 19: (Private) Star Party for School. Need more scopes, PAStimes Star Tour Members Only.

Feb 20: Public Star Party at ASU West. RSVP is with Paul at

paul.schmidtke@asu.edu. Everyone Welcome! 7pm to 9pm.

Feb 21: (Private) Star Party for School. Need more scopes, PAStimes Star Tour Members Only.

Feb 24: Back up Date for CTCA of Feb 3.

Feb 27: Public Star Party at Black Mountain Campus of PVCC from 7pm to 10pm. RSVP is with Terri at Events@pasaz.org.

Mar 6: PAS Meeting 7pm to 10pm PVCC Main Campus LS-109. Bring a snack to share. Water provided by President Bruce. Bring a friend! Everyone welcome!§

PAS Music Jam Dec 21

By Terri, Event Coordinator

We had a great event. We started at 5:30 with a wonderful potluck and even had left over food when done. Ed Wurst & Terri Finch brought the pizza. Ora provided some awesome cookies. Darlene brought puffs, string cheese and grapes. There was a rotisserie chicken brought by Bob. The food was great!

Attendance was: Rodney Fong, Don Boyd, William & Terri Finch, Ed, Bette & Bruce Wurst, Earl DeLong, Darlene Ahl-

feld, Judy Wolfe, Sam Insana, Mike Marron (host), Bob Senzer, and Eric & Ora Steinberg.

After enjoying dinner, we did the Music Jam. Don Boyd played the keyboard and sang along with Darlene & Ora. We had some great dancing from Ora and Darlene. Eric played his Recorders and the bass guitar. Sam played the keyboard and trumpet, Terri played the keyboard & flute (brought the guitar but didn't get to play it), Bruce

played the banjo, mostly, but borrowed Terri's guitar for a few songs at the end of the Jam, and Ed Wurst played accordion.

Many thanks to everyone who participated in the food and the music. It was a great party. Many thanks to Mike for hosting this event at his home in Carefree. We look forward to next year's event! The videos taken at this event will be shared at the PAS Awards Ceremony in April 2014. §

Space Place in a Snap!

NASA's Space Place is pleased to announce a new way to learn about science—Space Place in a Snap! These brief, narrated stories are engaging and entertaining, and they come with a downloadable poster, too. In our first episode, we tackle the ques-

tion of how our solar system came to be the place it is today. Check it out: <http://spaceplace.nasa.gov/solar-system-formation>.

You can also find great interviews from our Space Place Live! series as well as

Space Place in a Snap! at the NASA's Space Place You Tube channel at: <http://www.youtube.com/user/nasaspaceplace?feature=watch>. ***

Leonids Meteor Shower Party Nov 16

By Terri, Event Coordinator

It was a nice evening to get together to socialize, eat, and have a great party. At first, we arrived and the weather wasn't looking good. Two PAS Members brought their scopes: Terry Dancer and Rick Cunningham. There was plenty of food to go around. We had 2 rotisserie chickens, and 2 roasted turkey legs. There was 1 pizza and ice cream, pecan pie, a cheese cake, some donuts, a chili made by Greta Young, salsa made by the Finches, baked cinnamon apples, and more. In attendance were Bob Senzer, Ed, Bette & Bruce Wurst, William & Terri Finch, Don Boyd, Mike Marron (the host of the party), Eric & Ora Steinberg, Kevin Harcey, Rodney Fong and Ofelia Waters (plus the two mentioned above with telescopes).

So, the night had clouds at first, then it cleared for about 3 hours. During that time Terry had his newest scope, Leeloo, set up for first light. And Rick had his dob set up and the two of them were showing the same view, switching eyepieces and having a great time outside. Several folk wandered out to take a look, then came back in. I was glad I saw through Leeloo as she is an awesome scope. Then the clouds took over and the night of viewing ended.

So, there was eating, viewing and socializing all night long. Some of the members left about 11pm. Others stuck around until the clouds canceled the viewing about 12:15am. That's when Terry and Rick departed.

This party was set up as a Leonids Meteor Shower Party but the Moon was way too bright to see any Meteors, so I'm glad we had 2 scope attend. Also, this was Rick's birthday party and I'm so thankful so many PAS Members joined us for the celebration. Many thanks to Ed Wurst who pulled out a keyboard and led us in singing "Happy Birthday" to Rick. And many thanks to Bob Senzer who provided the birthday card for all of us to sign. So, I presented the card to Rick, then told him we would pass it around so that it is signed by everyone in attendance (as Bob had sealed the card in it's envelope not knowing I would forget to get a card for Rick). No public attended this event. It was a great party!§

CTCA Nov 19

By Joe Collins

We had a successful event last night: Nov. 19, 2013.

Mike Marron lectured on meteorites most of the evening. He had 5 patients and caregivers in attendance.

Don and I cancelled solar viewing earlier due to clouds; we could see two 'sundogs' but didn't get enough of the sun's disk to be able to see the massive sunspot group AR1897 that spewed out an X1 flare today. We were 'dogged' with overcast/high altitude cirrus clouds for most of the evening, but Don and I were able to show 8 customers: patients, caregivers and employees several objects when they 'poked out of the clouds':

Venus, really close to earth tonight, and having a phase like a waxing crescent moon, as described by one patient, "looked like a colorful banana!" The color of course was from birefringence caused by the cloudy atmosphere and bright light reflected by Venus.

Vega, the star (not to be confused with Vegas stars) looked bright blue as usual, but nearby object M57, The Ring Nebula was not visible.

Betelgeuse, the red supergiant star at the right 'armpit' of the constellation, Orion, the hunter, was visible and fiery, but nearby belt of Orion stars and the Orion Nebula (M42) were obscured by clouds.

We showed patients the Moon for two hours with and without filters to be able to see the craters with more definition. Crater Tycho, with its 'ray structure' really stood out. The recently full moon of November (on Nov 17) was the 'Full Beaver Moon or Frosty Moon'. Fur trappers of the 1700 1800s called it the Full Beaver Moon because it was the sign of the end of beaver trapping season- afterwards the rivers would frost up or freeze over and beavers would hibernate or hide away for the winter....

Finally we showed off Jupiter and its Moons and I showed our customers what the visible Moons of Jupiter look like close up with the Sky & Telescope JupiterMoons app on the iPad.

During the course of the evening/night we could see the lights of four F16s from Luke AFB run a few sorties and we counted 16 orange magnesium flares over the Estrela mountains in the direction of the Barry J Goldwater test range. This turned into an interesting discussion with patients about the possibility of alien life and how to identify U.F.O.'s with binoculars, by looking for tattle-tale signs of military flares (their color, smoke plumes and downward drift) and navigational lights on commercial vs. military aircraft.

Well, this is all I have to report this time! Our next event, the last for this year will be on Tuesday December 3, with a back-up date only one week later, Dec 10.§

Bookmans Telescope Workshop Dec 22

By Terri, Event Coordinator

Many thanks to William Finch, Don Boyd, Rodney Fong, Earl DeLong and Terry Dancer for assisting at this event. We had one RSVP, for whose scope was damaged the day before the event, so he canceled his participation. And then, while setting up,

Sandra showed up and talked to us for quite a while. It was a nice, easy event. When no one was needing our expertise, we chatted about telescopes, upcoming events and other club things.§

Star Party in Carefree Dec 28

By Howard Moneta, New PAS Member

We had a really fun time last night. Full tour of Mike's house. Lots of space rocks to examine, good conversation, good dinner, and the stars even made an appearance at around 10 p.m. §

Meeting of the Minds Jan 16

By Terri, Event Coordinator

I wish to put out a big thank you to everyone who brought snacks to this meeting. We had a great party! This was an awesome meeting and it was made that way with all the attending participants. PAS has the best Members of any astronomy club!

The evening opened up with the Meeting of the Minds Agenda that had 2 topics to discuss. The first topic, brought up by Terri, was a request to change the Meeting of the Minds to a quarterly meeting in which we have it, whether there are enough topics or not. And with the spare time, after the topics are concluded, we have presentations, or movies, of other fun stuff and make it a Social time. This was approved by the members in attendance. And it was agreed that if we don't have space in a month to hold a Meeting of the Minds (due to great weather and other events) we will bump the meeting back a month, and continue from there. So, we won't always have a Meeting of the Minds (MOM's) in January, as an example. It will move around as needed, but once a meeting is had, then 3 months later will be the next meeting, whether we need to have it or not.

The next topic was Guest Speakers, brought up by William. This year has really been difficult to find guest speakers. I am guessing it might be due to gas prices, or other factors, or just that everyone is so very busy, but if you look at the guest speaker list (on line or on the back of the Newsletter), you will see I'm really trying to get guest

speakers, with no luck. So, William brought up the idea that we need to brainstorm to find guest speakers. And he suggested that while you are watching a documentary, or a show on TV, or browsing the internet, if you run across a really good speaker and can find their contact info, send it my way - to Events@pasaz.org. If everyone in the club came up with just one possible speaker, I might be able to fill our 2014 Guest Speaker schedule. So, during this discussion, we all brainstormed on who we'd like to see as a guest speaker, and I took notes. Then, the next morning, I emailed out to the Members to ask that anyone who made suggestions, please research the contact info and find me the data I need to get those people as guest speakers. I really appreciate all the suggestions. If I can have a little help getting the contact info, it would be greatly appreciated. So, along with this speaker search, it was brought up we should do some field trips, possibly to ASU Tempe, which has a bunch of cool departments we can visit as a group. The attendees were leading me to believe they wanted FREE tours. So, I will research that possibility, and if anyone finds any contact info that is useful for me to get these field trips happening, send it my way. Any help is so really needed and appreciated.

Then we turned the meeting over to Eric Steinberg who suggested to me that we show a video on John Dobson, who had passed away the day before this meeting. It

was 10 minutes long and really talked about PAS... the the outreach we do. Thank you Eric, for sharing that video.

We then took a mini break, got snacks, hit the bathrooms and continued with a movie (1.5 hours long) provided by Alex Vrenios "Destination Moon." Very good movie. It was from the 50's and showed what they thought a trip to the Moon would be like. About 1/2 way through, the attendees starting adding comments to the movie, which really made the movie seem funnier than it was. But the movie was good. Many thanks to Alex for bringing the movie to the meeting. We concluded the meeting at about 10:05pm. Thanks to all who attended and made this meeting a success. I hope to hear from you in email about those Guest Speakers and their contact info.

Next Meeting of the Minds is scheduled for May 15th. We are not counting the Awards Ceremony as a Meeting of the Minds. We will keep that event separate. We will start gathering topics in April, so be thinking of what topics you'd like to discuss, and if you have a movie or documentary you wish to share, let me know. We can also open up the MOM's to Show and Tell. Do you have some astro photos you took that you'd like to share, or maybe you attended an event you wish to promote, like the Grand Canyon Star Party or the Messier Marathon? Bring photos, talk about these items at the MOM's. See you at the next one.§

PVCC Telescope Workshop Jan 23

By Terri, Event Coordinator

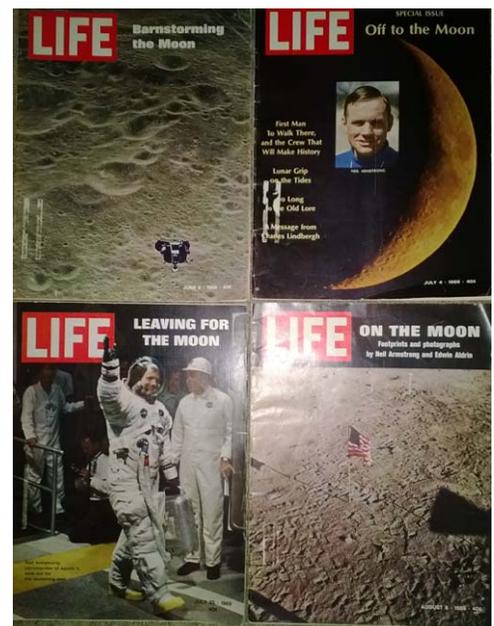
It was a cloudy night. We viewed a few objects through the clouds and one time, Jupiter popped out and looked awesome and mostly clear. Many thanks to the PAS Members who attended as Telescope Teachers: William Finch, Don Boyd, & Rodney Fong.. In attendance and new PAS members who were there to learn how to use their scopes were: Kevin Witts (brought his C 8" SCT), Howard Moneta (brought his 8" scope), and Aimee Heintz (brought her 8" Dob). We had one guest: Carolina Barnes (brought her Tasco #30-060402 scope). Additional helpers were Terri Finch, Bob Senzer, & Jenny Weitz who had 5 of her Honor Students in attendance.

The objects viewed were noted by Bob Senzer (thank you Bob for making me a list) Jupiter with 4 moons, Orion Nebula, Pleiades, Mintaka (double star), M33 and Rigel. We could barely make out the constellation of Orion, but the event was super successful.

Jenny's Honor Students took out 2 of the 6" Dobs and eyepieces and learned how to use the telescopes. This was an awesome event! It was a bit chilly, but decent and fun! Many thanks to everyone who attended. We look forward to the next event like this one on April 10th. See you there! Photos from this event will be in the PAS Photo Gallery, soon.

Howard writes: Hi Terri. Haha that's funny about the weather today. I did a lot of online looking for accessories after last night. Looked at everything from fancy finderscopes to eyepiece and filters. Also learned how to read the dark sky observing chart on the pasaz.org

(Continued on page 8)



These 4 Life Magazines will be auctioned off at the February PAS meeting

CTCA-PAS SkyTour Jan 6

Prepared by Joe Collins CancerFighter™ & Phoenix Astronomical Society member

This event was staffed by Don Boyd (PAS StarTours Member), Joe Collins (CancerFighter™, PAS StarTours member), Renee Collins (CancerFighter™ & Volunteer), Terry Dancer (PAS StarTours Member) and his fiancée Laura Strelka (Visitor). Don had solar viewing, but no customers because our event was not advertised on the CancerFighter or Patient Event calendars. This was the first event of 2014 and the first time we have had an event scheduled on a Monday. We had six customers (patients, caregivers and Cancer-Fighters) upstairs on the 5th floor garden terrace for the SkyTour event, and lunar observing. The evening was clear and only a little chilly.

Joe Collins (jcollins79@cox.net) Terry's Dobsonian telescope was up and running before Don and I could get our star alignments completed and Terry brought a good variety of eyepieces which made viewing all the more interesting this evening. Jupiter was in opposition and close approach to earth tonight; we were able to see the 4 major Jovian moons, watch the transit of the GRS (Great Red spot) and occultation of Europa. We looked at the waxing crescent Moon, almost at first quarter and had a very clear view of mountain shadows and crater details at the terminator. Even though the Moon was out, we could still see a pale blue-green dot, the planet Uranus about 2 Billion miles away. We looked at several open clusters: M38, M44 Beehive, M45 Pleiades, The "double cluster"; and my personal favorite deep space object, the Great Nebula in Orion (M42). To prove the sky was clear, we were even able to spot the "blue snowball" nebula. The night was also spectacular for viewing multiple and binaries. At the end of the event, I got with the security guards and we wrote up a work order to get the luggage carriers tires inflated- they were almost flat- we depend on them to get our gear up to and down from the 5th floor and I am sure patients and guests will appreciate how much easier they will be to use now. Don

and I did some simple troubleshooting of his mount and found it just needed to be shut off longer before redoing star alignments in the future. This was giving him troubles most of the night, so his "gotos" were off.

Don Boyd (azphotog@gmail.com) I viewed the ET Cluster, the double cluster, the Pleiades, and Jupiter despite the fact that my "gotos" were off most of the night. Two ladies show up just before 10pm who said if they had known that we were up there they would have been there all night. I showed them Jupiter and they were so excited to see it. One of the ladies said the last time she was there we showed her Saturn. I did not have any people show up for Solar, which is a shame, as there was a huge cluster of Sun Spots right in the center of the sun's disk (active Region AR1994 that was erupting M class flares during the week).

Terry Dancer (tmranger86@gmail.com) The views through my 8" dob were some of the best I've had, at least to me anyway. Jupiter looked fantastic, the cloud bands were well defined and the Great Red Spot was clearly visible, almost as if the planet was looking back at us ha ha. Next, I viewed M42 the Orion Nebula which looked pretty good. It would have been better but it was positioned somewhat towards the buildings lighting so it was slightly drowned out. I was able to easily break apart the 4 major stars in the trapezium. I also briefly viewed M45 (The Pleiades) and NGC-457 (The ET Cluster) which both looked good. ET was doing his usual headstand. I can't wait to try out the refractor next time. This being my first CTCA event, and not knowing how things work yet I can't really comment on what we could change to make it better. I would say adding the event to the patient calendar and moving the sign closer to the entrance would be a good start, and yes, air up those tires on the dolly. It wasn't too bad rolling the 45lb. Dob but next time I'll have

the refractor, goto mount and accessories, which will weigh-in at around 150lbs.

Acknowledgments- Thanks go to Jennifer Kehren of CTCA for printing out our flyers and providing meal tickets to pick-up from the concierge and the advertising placard near the entrance of Ricardo's café with the corrected hours of the SkyTour event. We also want to recognize our volunteers: Laura and Renee.

Improvements- We need to get our events back on the patient/event/concierge/Cancerfighter calendars to increase awareness of the events and attendance especially now that we are doing these events on a different day: Mondays!

Next time- We (PAS) are looking forward to coming out again next month on Monday February 3rd 2014.

Some helpful Java Scripts from Sky & Telescope (and Internet links from other sources):

http://www.skyandtelescope.com/observing/objects/javascript/moon_phases

Moon Phases on any date

<http://www.skyandtelescope.com/observing/objects/javascript/jupiter#> Jupiter and Galilean moons simulator

<http://www.skyandtelescope.com/observing/almanac/almanacCustom?latitude=42.383&longitude=71.133&tzzone=7&UTdate=now&UTtime=now#> Moon & Planets Almanac

<http://skychart.skyandtelescope.com/skychart.php> Interactive Sky/Star Chart

<http://www.lunasociety.org/atlas/> Full Moon Atlas by grid zones

<http://earthsky.org/tonight> A beginner's website showing what is up tonight

<http://www.skyandtelescope.com/observing/ata glance> An intermediate website with a weekly update on celestial events

<http://tonightssky.com/> A website for amateur astronomers to plan a viewing list of celestial objects for a given place and time.§

For Sale:

Meade LX200 8" SCT with original instruction book, diagonal prism & 7 super plossl eyepieces, super wide angle: 40mm, 32mm, 26mm, 12mm, 4mm, 6.4mm & 15mm with the best tripod available, super heavy and scope is in original boxes.. Asking \$1300 OBO Contact Roger at Schollra@aol.com or 480 991 0133.

Arizona Sky

By Leah Sapir



February is a good time to look at interesting objects in Monoceros, a small, faint constellation east of Orion. Monoceros is supposed to represent a unicorn – probably because it is practically invisible. However, it is located in a region that includes many beautiful star clusters and nebulae, adding to the unicorn theme: invisible but magical.

One of the easier-to-find attractions of Monoceros is M50, an open cluster visible with a telescope or binoculars, and located about 1/3 of the way from Sirius to Procyon. It was apparently first discovered by Giovanni Cassini some time before 1711, but Charles Messier discovered it independently in 1772, and added it to his list. M50 is about 3000 light years away and 15 light years across, and is about 100 million years old. There are some prominent reddish stars seen in and around M50, but they might not be actual members of the cluster.

Other popular objects in Monoceros are the Rosette Nebula (NGC 2244) and Cone Nebula (NGC 2264), that we've discussed previously. But further exploration in Monoceros uncovers more treasures! A little to the northwest of M50 is a nice little nebula with both emissions and reflection regions. It is apparently one nebula, but it received two NGC numbers because it was discovered piecemeal: William Herschel first described the western part (NGC 2316) in 1785, and then William Parsons, Earl of Rosse, discovered the eastern part (NGC 2317) in 1851. The division between emissions and reflection goes the other way, though: the northern region is an emissions nebula and the southern part is reflection, as can be seen here: <http://tinyurl.com/m24omnb> (image credit: Rick Johnson). The nebula is about 3600 light years away and only 3-4 light years across.

Moving down, about 2 degrees almost directly south of M50 is a group of emissions nebulae nicknamed "the Seagull". The main part of the seagull, representing the gull's wings, is a very large nebula, extending diagonally about 2 degrees from northeast to southwest. At a distance of around 3800 light years, it is about 200 by 60 light

years in size. The seagull's head is actually a separate, closer nebula, also known as Gum 1; it was discovered by Australian astronomer Colin Gum in 1955. The Gum nebula is about 4 light years across and 800 light years away. A very pretty reflection nebula, NGC 2327, can be seen near the bottom of the gull's southern wing, although that NGC number has also been used to indicate the Gum 1 nebula in some sources.

Two small open clusters decorate the seagull: NGC 2335 at the top of gull's northern wing, and NGC 2343 to the left of the gull's wingspread, forming part of the tail. Both clusters are about 3000 light years away, and might form a double system; if so, they are about 30 light years apart. Both were discovered by William Herschel in 1785. NGC 2335 is about 10 light years in size and 200 million years old. NGC 2343 is a little smaller, about 7 light years, and younger: only 100 million years in age.

Another open cluster in the neighborhood is NGC 2353, about 1.5 degrees east of NGC 2343. This one is a little farther away from us – probably around 3500 light years – and 20 light years in size. It is about 100 million years old, and like its neighbors was discovered by William Herschel in 1785.

Continuing about 3 degrees south of NGC 2353, or 4 degrees southeast of the Seagull, is a small but interesting nebula in Canis Major: NGC 2359, also known as "Thor's Helmet". The nebula exhibits a bubble shape, with attached wings, and an intricate structure of shock waves. It is illuminated by a very hot giant star called a



Seagull Nebula (image credit: ESO/Digitized Sky Survey 2. Acknowledgement: Davide De Martin)



Thor's helmet (image credit: NOAO/AURA/NSF and SSRO/PROMPT/CTIO)

Wolf-Rayet star, which is in a stage just prior to supernova. The bubble shape and shock waves are produced by the star's fast solar wind, and its interactions with a nearby cloud of molecular hydrogen. Thor's Helmet is 15,000 light years away and 30 light years in size.

Meanwhile, back in the solar system, we have a great opportunity to view Mercury this month! Usually Mercury sticks so close to the Sun that the best we can do is try to catch it in the twilight; but in the last few days of January and first few days of February, Mercury will be in the west after



Arizona Sky

sunset and will even stay up a little after dark, till around 7:30 pm. And on January 31, the crescent Moon will join Mercury low in the western sky after sunset.

Neptune will also be low in the western sky after sunset, but as usual we need a telescope to see it. After the first week of February, both Mercury and Neptune will be fading into the sunset. Uranus will be a little higher in the west after sunset, and sets around 10:30 pm at the beginning of February and 8:30 pm at the end of the month.

Jupiter will be high in the east at sunset. It is past its opposition, so even though it will be up most of the night, it will be setting earlier – 5:30 am at the beginning of February, and 4 am at the end of the month. The full Moon will follow Jupiter across the sky on February 10-11 and 11-12.

In the meantime, Mars and Saturn are still morning stars but are beginning to rise earlier. At the beginning of February, Mars will rise around 11:30 pm and Saturn at 1:30 am; at the end of the month, we will see Mars at 10 pm and Saturn around midnight. Of course, as Mars starts to rise earlier, it is a sign that the red planet is getting closer and approaching opposition. It is now around one AU from us – 93 million miles – and when it reaches opposition in April it will be less than 60 million miles

away. This is not one of its closest oppositions, to be sure, but certainly better than when it is at the far end of its orbit. The visual diameter of Mars is now around 10 arc seconds and its magnitude is around zero; at opposition it will be 15 arc seconds and reach a magnitude of -1.45 , approximately the same as Sirius - not as bright as Jupiter but a lot brighter than Saturn.

The Moon will accompany Mars across the sky from east to south on February 18-19 and 19-20, from around 11 pm to dawn; and then the Moon will join Saturn on February 21 and 22 from 1 am to dawn.

Venus is an early morning star and rises around 5 am this month. The crescent Moon will be close to Venus in the east before sunrise on February 25 and 26.

We don't actually have a new moon this February; the Moon will reach that



NGC 2316 and 2317 (image credit: Rick Johnson)

phase on January 30 and March 1, and it will be full on February 14.

Join us next time when we continue to explore the Arizona sky. And till then, wishing you clear skies and happy observing! §

2014 Meeting of the Minds Dates

By Terri, Event Coordinator

Due to a decision at the last Meeting of the Minds (Jan 16), it was decided to hold the Meeting of the Minds (MOM's) quarterly, or where it can fall into the schedule, conveniently. So, here are the dates of the 2014 MOM's. Put them on your calendar. We just did the January MOM's. Three months later puts the next one in April. But

we have our Awards Ceremony in April, and it is NOT a MOM's, so let's bump the meeting to May 15. After that, we have Sept 11, and then not again until Dec, but there is no time in Dec to have one, so we come back to January 2015, for which I haven't picked the date just yet. So, these meetings will be updated on the PAS Calendar, and

all other MOM's that were scheduled, will be canceled at this point. However, if we need to call an emergency meeting to vote on something, one of the empty dates in our schedule, on a Thursday, may be used to do that Special Voting meeting. The changes will show up on the calendar, soon.§

Bookmans Telescope Workshop Jan 19

By Terri, Event Coordinator

It was a very successful event at Bookmans this month. In attendance from PAS was Howard Moneta, Terri & William Finch, Don Boyd, Earl DeLong, Rodney Fong, & Terry Dancer. We had tons of questions and topics.

Attending for the workshop was Kevin Witts with his SCT CPC 800, Deanna Sandvig, who wanted to find out what scope to

purchase for her husband's birthday, and Aimee Heinz with her 8" Orion Dob.

We had a few walk ins whom we gave star charts to and invited to our events.

I wish to welcome new members Aimee Heinz & Kevin Witts. Next Telescope Workshop at Bookmans will be Feb 16. We hope to have another great event! Thanks to all the PAS members who assist-

ed at this event. Photos of this event will eventually be in the PAS Photo Gallery.

Deanna writes: Hello Terri, Thank you and everyone there for the great information and thank you for making me feel so welcome. I am excited about Jerry and I jumping into astronomy. Have a wonderful week.

Kevin writes: Thanks for the help and advice yesterday. §



Surprising Young Stars in the Oldest Places in the Universe

By Dr. Ethan Siegel

Littered among the stars in our night sky are the famed deep-sky objects. These range from extended spiral and elliptical galaxies millions or even *billions* of light years away to the star clusters, nebulae, and stellar remnants strewn throughout our own galaxy. But there's an intermediate class of objects, too: the *globular star clusters*, self-contained clusters of stars found in spherically-distributed halos around each galaxy.

Back before there were any stars or galaxies in the universe, it was an expanding, cooling sea of matter and radiation containing regions where the matter was slightly more dense in some places than others. While gravity worked to pull more and more matter into these places, the pressure from radiation pushed back, preventing the gravitational collapse of gas clouds below a certain mass. In the young universe, this meant no clouds smaller than around a few hundred thousand times the mass of our Sun could collapse. This coincides with a globular cluster's typical mass,

and their stars are some of the oldest in the universe!

These compact, spherical collections of stars are all less than 100 light-years in radius, but typically have around 100,000 stars inside them, making them nearly 100 times denser than our neighborhood of the Milky Way! The vast majority of globular clusters have extremely few heavy elements (heavier than helium), as little as 1% of what we find in our Sun. There's a good reason for this: our Sun is only 4.5 billion years old and has seen many generations of stars live-and-die, while globular clusters (and the stars inside of them) are often *over 13 billion years old*, or more than 90% the age of the universe! When you look inside one of these cosmic collections, you're looking at some of the oldest stellar swarms in the known universe.

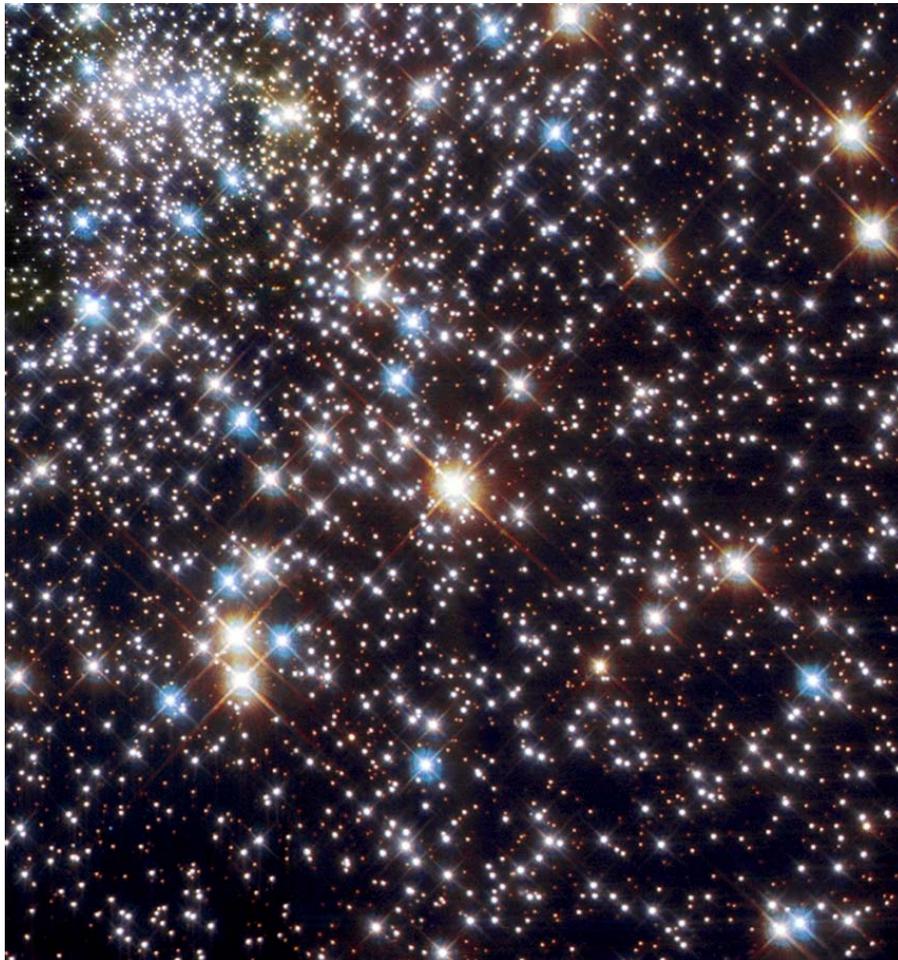
Yet when you look at a high-resolution image of these relics from the early universe, you'll find a sprinkling of hot, massive, apparently *young* blue stars! Is there a

stellar fountain of youth inside? Kind of! These massive stellar swarms are so dense -- especially towards the center -- that mergers, mass siphoning and collisions between stars are quite common. When two long-lived, low-mass stars interact in these ways, they produce a hotter, bluer star that will be *much* shorter lived, known as a *blue straggler star*. First discovered by Allan Sandage in 1953, these young-looking stars arise thanks to stellar cannibalism. So enjoy the brightest and bluest stars in these globular clusters, found right alongside the oldest known stars in the universe!

Learn about a recent globular cluster discovery [here: http://www.nasa.gov/press/2013/september/hubble-uncovers-largest-known-group-of-star-clusters-clues-to-dark-matter](http://www.nasa.gov/press/2013/september/hubble-uncovers-largest-known-group-of-star-clusters-clues-to-dark-matter).

Kids can learn more about how stars work by listening to The Space Place's own Dr. [Marc: http://spaceplace.nasa.gov/podcasts/en/#stars](http://spaceplace.nasa.gov/podcasts/en/#stars).

Globular Cluster NGC 6397. Credit: ESA & Francesco Ferraro (Bologna Astronomical Observatory) / NASA, Hubble Space Telescope, WFPC2.



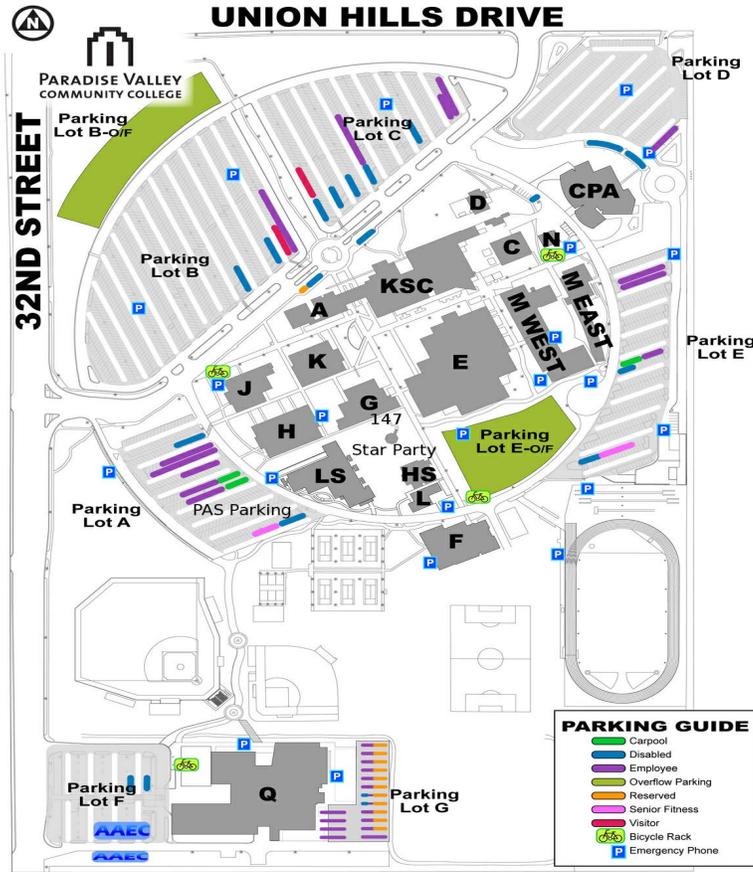
PVCC Telescope Workshop Jan 23

(Continued from page 4)

website today. Last night was really fun. It had been a tough day so it was great to spend time doing astronomy with nice people. I learned quite a bit about the telescope and thanks to the tips, now have some experience looking in it. The Orion Nebula was definitely the celestial highlight. Read all about it today. Thanks again. Looking forward to next week!

Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



See page 2 for more details

February 2014

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1 School Star Party (Private)
2	3 CTCA (private)	4 School Star Party (Private)	5	6 PAS Meeting	7 School Star Party (Private)	8
9	10	11	12 School Star Party (Private)	13	14	15
16 FREE Telescope Workshop	17 President's Day	18	19 School Star Party (Private)	20 ASU West Public Star Party	21 School Star Party (Private)	22
23	24 CTCA Back up date	25	26	27 Public Star Party at BMC	28	

Don Boyd
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To:

2014 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.

Mar 6: Speaker: TBA

Apr 3: Speaker: TBA

May 1: Speaker: TBA + Officer Elections

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What's Up For February

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	02-15-14	05:29	16:22
Venus	02-15-14	04:17	14:57
Mars	02-15-14	20:52	08:20
Jupiter	02-15-14	12:32	02:51
Saturn	02-15-14	23:00	09:39
Uranus	02-15-14	07:26	19:50
Neptune	02-15-14	05:51	17:01
Pluto	02-15-14	02:46	12:59

All Times Arizona Time

Feb 15 2014

Sunrise: 07:02

Sunset: 18:13



New: January 30



Q1: February 6



Full: February 14



Q3: March 1