

PAStimes

Phoenix Astronomical Society
www.pasaz.org

May 2013
Volume 64 Issue 9

PHOENIX ASTRONOMICAL SOCIETY — ESTABLISHED 1948

Paul Wieland to Speak at May 2 Meeting

Info provided by Paul, edited for Newsletter by Terri

Paul Wieland caught the "stargazing bug" when growing up in the 1960s not just because it was the space race era, but also his older brother bought a telescope kit from Edmund Scientific and hand-ground his own 6" reflector telescope. That opened up many of the mysteries of the night sky as he tagged along with his brother on many cold winter nights seeking dark places to view the moon, planets, stars, and nebulae. Like many kids of the time, he wanted to be an astronaut or work for NASA in some capacity, but by the time he graduated from high school, NASA was reducing the workforce. However, the opportunity did come.

Later earning degrees in botany and mechanical engineering, Paul began working for NASA in 1983 as a co-op student and had small roles in the Hubble Space Telescope project, the SpaceLab 3 mission, and the shuttle Challenger accident investigation. For most of his career he was involved with developing the life support system for the International Space Station and planning for missions to the Moon and Mars. In 1991, Paul was a founding member of the Institute for Advanced Studies in Life Support, which established the Journal of Life Support & Biosphere Science (later



Photo courtesy Paul Wieland

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PAS Meeting Apr 4

By Terri, Event Coordinator

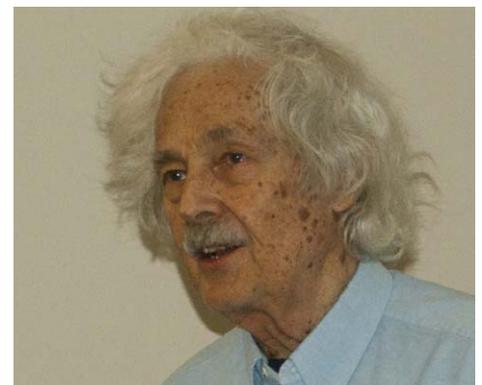
The April 4th PAS meeting was awesome. We had a most fantastic guest speaker: Chet Schuler, who presented on what filters were best to use on your telescope to enhance the views. Very informative, very good presentation. Chet is always a welcome guest speaker, as he has so much knowledge to share.

President Bruce opened the meeting with brief introductions of the Officers of PAS since we had a few new people in attendance. Then we had Dave, who is from Michigan and knows Mike Marron, and Gene Lucas do brief announcements of who they are - guests. Gene also announced a few upcoming EVAC events. We opened the night to a few announcements as well. Jerry announced the upcoming May 24, 25, 26 Rocket Launch. Mandy announced Rachael's A+ in school, Mike announced that

PAS has regained its 501 (c) (3) status, Terri announced the Potluck for the Apr 13 event at Mikes, the Book Swap and Magazine swap going on at every PAS meeting and PAS Meeting of the Minds. Then we turned the floor over to Chet.

Chet's presentation was shorter than most, but it was super informative, and if you missed this one, you really missed some great information. In attendance was Bob Senzer (Welcome to the meeting Bob), Dave DeBruyn from Grand Rapids, MI, Darren Johnson, Sam Insana, Earl DeLong, Jerry Belcher, Matt Kohl, the Finches, the Wursts, the Hervieux's, and their friend Joshua Frank, Jenny Weitz, Darlene Ahl-efeld, Greg Coons, Lou Roberts, the Vrenios's, the Steinberg's and Kevin Harcey. 26 in attendance counting Chet. Many thanks to those who provided snacks at this

meeting. Sam brought popcorn, Darlene had the grapes, Bob Senzer brought the Oreos, Ed brought the cake and cookies, and President Bruce provided the bottled water. It was an awesome meeting. Thank you all for attending. See you at the next one on May 2 for the PAS Pizza Party and PAS Elections. ***



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<u>Rocketry Liaison</u>	Jerry Belcher	623-328-9290	http://ahpra.org/launches.html

May, June, July & August Upcoming PAS Events

By Terri, Event Coordinator

Do you want to host a star party at a location of your choice during the summer months with PAS? Contact Terri to get that event lined up for Summer 2013 at Events@pasaz.org. Further information may be found at <http://www.pasaz.org/forums/calendar.php>

May 2: PAS Meeting 7pm to 10pm PVCC Main Campus LS-201. Today is PAS Elections, Pizza party & an awesome Guest Speaker! Bring a friend! Everyone welcome!

May 3: School Event (Private) 7pm to 9pm. RSVP by day before to attend. Details are in the calendar on listing for this event. RSVP is with Terri.

May 4: Private Star Party - details to be posted in calendar. RSVP is with Terri for this event.

May 5: Spend Cinco De Mayo with PAS at Bookmans FREE Telescope Workshop. 3:30-5:30pm. PAS Members, let Terri know you are attending. If you are attending to find out how to use your telescope or learn about telescopes, please RSVP Events@pasaz.org by noon the day of the event. Bring something to take notes with, your telescope, accessories, questions. RSVP is required. We meet in the Musical Instrument section of the store.

May 7: Rancho Gabriela Daytime Career event 8am to 3pm. Come help show the daytime sky to 900 kids at this school: Sun, Moon, Venus, Jupiter will be visible. Plenty of food all day long. Your help is needed. RSVP with Terri 2 days prior to event. Set up is 7am and this school is in Surprise.

May 7: CTCA (Private) 8pm to 10pm. RSVP with Joe. PAStimes Star Tour Members only.

May 9: Black Mountain Campus (BMC) Public Star Party 7pm to 10pm. RSVP is with Terri. Bring everyone you

know! Black Mountain campus of PVCC is located at 60th Street and Carefree Hwy S.W. corner. Awesome dark sky location!

May 10: Estrella Observatory Star Party (private) 5:30pm Potluck, 7:30pm Star Party. RSVP is with Yves or Terri for this event. Sign up in Potluck & bring your scope!

May 11: Private star party in N. Scottsdale - detail will be in calendar listing for this event.

May 11: CEO (Private), sundown to whenever. See detail in calendar.

May 11: Dark Sky Antenna's Star Party (Private) Event begins at sundown and goes to dawn. RSVP is with Eric for this event. Bring you own everything.

May 16: Free Telescope Workshop at PVCC main Campus - 32nd Street & Union Hills- 7pm to 10pm. RSVP is required with Terri Events@pasaz.org. When you RSVP - leave number in your party and type of scope you are seeking help with. This is also a good class to attend to get ideas on what type of scope you should purchase. And this is a public Star Party!

May 18: Private DBG Kids 7:30-9:30pm - RSVP is closed at this time.

May 21: CTCA Back up date for May 7.

May 25: 1st Virtual Star Party (VSP) Training Session at Chris's home in Good-year. Come learn how to set up your photography session to do Remote Astrophotography through Chris's scopes in Mayer. Gathering at 2pm at Chris's home, plan to be there a minimum of 2 hours, possibly into the evening as we do our first VSP. If we extend into the evening, bring cash and we will split the cost of ordering pizza for dinner for all. More details in the PAS Calendar & this is for PAS Members only.

May 28: Conjunction of Venus & Jupiter.

May 30: Tentative PAS Meeting of the Minds. In LS-201. This event is only held if there are enough topics to hold the meeting. If it is held, a notice will go out by email, and it will be a party, so bring a snack to share. 7pm to 10pm.

----- JUNE -----

Jun 1: Back up date for DBG of May 18.

Jun 1: (Private) NSTS at Mike's. Potluck at 6:30pm. Viewing & training at 8pm. If Terri is unable to attend, this will be a dark sky viewing session and no NSTS.

Jun 2: Bookmans FREE Telescope Workshop. 3:30-5:30pm. PAS Members, let Terri know you are attending. If you are attending to find out how to use your telescope or learn about telescopes, please RSVP Events@pasaz.org by noon the day of the event. Bring something to take notes with, your telescope, accessories, questions. RSVP is required. We meet in the Musical Instrument section of the store.

June 4: CTCA (Private) 8:30pm to 10:30pm. RSVP with Joe. PAStimes Star Tour Members only.

June 7: Private star party - details will be in calendar for this event.

Jun 8: Dark Sky Antenna's Star Party (Private) Event begins at sundown and goes to dawn. RSVP is with Eric for this event. Bring your own everything.

Jun 8: CEO (Private), sundown to whenever. See detail in calendar.

Jun 8: (Private) NSTS at Mike's. Potluck at 6:30pm. Viewing & training at 8pm.

Jun 18: CTCA Back up date for Jun 4.

Jun 23: Bookmans FREE Telescope Workshop. 3:30-5:30pm. PAS Members, let Terri know you are attending. If you are

June, July & August Upcoming PAS Events

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attending to find out how to use your telescope or learn about telescopes, please RSVP Events@pasaz.org by noon the day of the event. Bring something to take notes with, your telescope, accessories, questions. RSVP is required. We meet in the Musical Instrument section of the store.

Jun 23: Biggest full moon of 2013.

Jun 27: Tentative PAS Meeting of the Minds. In LS-201. This event is only held if there are enough topics to hold the meeting. If it is held, a notice will go out by email, and it will be a party, so bring a snack to share. 7pm to 10pm.

----- JULY -----

Jul 6: Dark Sky Antenna's Star Party (Private) Event begins at sundown and goes to dawn. RSVP is with Eric for this event. Bring your own everything.

Jul 6: Estrella Observatory Star Party (private) 5:30pm Potluck, 7:30pm Star Party. RSVP is with Yves or Terri for this event. Sign up in Potluck & bring your scope!

Jul 14: Bookmans FREE Telescope Workshop. 3:30-5:30pm. PAS Members, let Terri know you are attending. If you are attending to find out how to use your telescope or learn about telescopes, please RSVP Events@pasaz.org by noon the day of the event. Bring something to take notes

with, your telescope, accessories, questions. RSVP is required. We meet in the Musical Instrument section of the store.

Jul 16: CTCA (Private) 9pm to 11pm. RSVP with Joe. PAStimes Star Tour Members only.

Jul 25: Tentative PAS Meeting of the Minds. In LS-201. This event is only held if there are enough topics to hold the meeting. If it is held, a notice will go out by email, and it will be a party, so bring a snack to share. 7pm to 10pm.

Jul 30: CTCA Back up date for Jul 16.

----- AUGUST -----

Aug 3: Dark Sky Antenna's Star Party (Private) Event begins at sundown and goes to dawn. RSVP is with Eric for this event. Bring your own everything.

Aug 3: Estrella Observatory Star Party (private) 5:30pm Potluck, 7:30pm Star Party. RSVP is with Yves or Terri for this event. Sign up in Potluck & bring your scope!

Aug 6: CTCA (Private) 8:30pm to 10:30pm. RSVP with Joe. PAStimes Star Tour Members only.

Aug 10: Perseids Meteor Shower party at Mike's in Carefree. Potluck is at 6pm. Public event. Sign up for potluck, and RSVP with Mike Primefactory@q.com to

attend.

Aug 11: Bookmans FREE Telescope Workshop. 3:30-5:30pm. PAS Members, let Terri know you are attending. If you are attending to find out how to use your telescope or learn about telescopes, please RSVP Events@pasaz.org by noon the day of the event. Bring something to take notes with, your telescope, accessories, questions. RSVP is required. We meet in the Musical Instrument section of the store.

Aug 20: CTCA Back up date for Aug 6.

Aug 29: Tentative PAS Meeting of the Minds. In LS-201. This event is only held if there are enough topics to hold the meeting. If it is held, a notice will go out by email, and it will be a party, so bring a snack to share. 7pm to 10pm.

Aug 31: Dark Sky Antenna's Star Party (Private) Event begins at sundown and goes to dawn. RSVP is with Eric for this event. Bring your own everything

----- SEPTEMBER -----

Sep 3: CTCA (Private) 8pm to 10pm. RSVP with Joe. PAStimes Star Tour Members only.

Sep 5: PAS Meeting 7pm to 10pm PVCC Main Campus LS-201. Bring a snack to share. Bring a friend! Everyone welcome! ***

Comet Info Websites

Provided by Leah Sapir

Weekly information about bright comets, edited by Seiichi Yoshida: <http://www.aerith.net/comet/weekly/current.html>

Ephemerides of visible comets from IAU Minor Planet Center: <http://www.minorplanetcenter.net/iau/Eph>

merides/Comets/index.html

Information about visible comets: <http://cometchasing.skyhound.com/>

Central Bureau for Astronomical Telegrams – IAU's official worldwide clearing-house for new discoveries of comets, solar-system satellites, novae, supernovae,

and other transient astronomical events, located at the Department of Earth and Planetary Sciences at Harvard University: <http://www.cbat.eps.harvard.edu/index.html>. If you ever discover a comet or supernova, this is the place to report your discovery! ***

Mike's Summer Lecture Series

By Terri, Event Coordinator for PAS

Mike has decided to do a lecture series during the summer months. We will plan to have them around the Full moon. Here's why. Mike tends to make his lectures very long, very informative and very good. Sometimes we plan a star party for after the Lecture and never get to the star party portion of

the event. So, this summer, we will have several lectures at Mike's house in Carefree, that will be a Potluck, Lecture, and then movie night for those who want to watch a movie at Mike's before heading home. These will be open to the public. A list of these events will be posted to the site as soon as

Mike and I have worked out the plans for the events. They will be Rain or Shine, since there is no star party with this event, it can be pouring rain and we will still hold the event. Come enjoy an evening of learning about cosmology with a very awesome guest speaker, Mike Marron. Everyone welcome! ***

2013 PAS Elections

By Terri, Event Coordinator

At the May 2, 2013 PAS Meeting / Pizza party & Election night, we will hopefully see a change of PAS Officers. All offices are open for the taking. Current President is Bruce Wurst. Current Vice President and Event Coordinator is Terri Finch. The Current Newsletter Editor is Don Boyd (with this position, you get 3 additional helpers to make your job easier).

Currently we have a PAS Host: Mikey Webb, who is also a Member-at-Large. However, because he took over as Host, we need to elect another Member-at-Large or another Host. We also have Dave Hellman as a Member-at-Large. And one of those positions runs 2 years, and the other one ran 1 year, and they will swap years that they are able to re-elect. It's a 2 year term. We

have the Treasury run by Mike Marron who is super willing to give up the position. We have a Webmaster, director position, who is Chris Johnson. I don't think Chris can give up his position as he is in charge of the PAS Website and hosts it. We will have to find out from him. So, come help us vote in our 2014 PAS Officers. ***

Meeting of the Minds Review of Mar 28

By Terri, Event Coordinator

The meeting of the Minds saw 14 in attendance. I wish to thank those who attended and gave their input for our 3 short topics on the Agenda. In attendance was Dave Hellman (Jenny took the night off), Chris Johnson - who gave a presentation, Alex Vrenios - who also gave a presentation, Mike Marron and his Mom, Bette & Ed Wurst, Sam Insana, Chet Schuler, Darren Johnson, William & Terri Finch, Don Boyd, & Darlene Ahlefeld. I wish to thank everyone who brought snacks to share. Ed brought many cakes and cookies, Sam brought the popcorn, Darren brought chips, I brought the plates and napkins and Darlene brought some too with her snacks and puffs. Bruce, absent, supplied the case of bottled water.

The night opened with a Chris setting up the computer for his presentation, which delayed our start by 5 minutes, but it didn't make any difference in time, as the night flowed along smoothly and interestingly. Alex took the floor first with a presentation called Analemma, which is the tracking of the Sun's Position in the daytime sky. Alex's presentation was very interesting. He always has something good to share with the group and presents it well, with humor, examples, visuals and just an all around great presentation. Analemma is one of the many observing programs you can do to receive a pin and certificate from the Astronomical League. There are many observing

programs.

When Alex concluded his presentation, Terri took the floor to lead the discussion of the Meeting of the Minds. The first item to come up for discussion was the possibility of accepting monies from potential new members as well as donors / sponsors, and that is through Paypal. What was decided was that we'd wait to see if our Non Profit status was given back to PAS. Several good ideas came of this discussion. Darren suggested a neat idea to accept credit cards where by you hook it up to your cell phone. This system is called Square. Sounds like an awesome idea for those of us who are officers and have smart phones. We talked about getting the PAS Paypal account and how it is free for non profit organizations, so PAS may have one or both of these options soon.

The next topic was the swapping of the April 13 and April 20 events. After great discussion, it was decided to leave both events as they are, except open both up to the Public, and both will have a Night Sky Training Session (NSTS). Those changes have been made on the PAS Website Calendar. Then we discussed the other 2 dates that have conflicting attendance issues: June 1 and June 8. June 8th was to be the next NSTS. However, several PAS members can't make it that date for various reasons, and because it is the Grand Canyon Star Party, so it was decided that we'd have

the NSTS at Mike's on June 1, and then on June 8 would be the next CEO. We concluded the discussions and gave the floor to Chris.

Chris is another PAS Member who is an awesome guest speaker. He always has his info planned out, knows what he is going to talk about, stays on track, adds humor, and is enjoyable to listen to. At a previous meeting, Chris announced that he wants to start up his CEO's and VSP's again. So, for the Virtual Star Parties (VSP), he gave us some insight into what programs are out there for processing photos, taking photos, etc. Along with his presentation in preparations for the next VSP, he also gave a really nice mini presentation about his Mayer CEO location. This was aimed at the newer members in the group, but the long time members also enjoyed hearing about CEO again. Then he turned his presentation to his attempt to photograph all 110 Messier Objects at the Messier Marathon. He showed us the photos and we were very amazed.

We then closed the meeting at 10pm. Many, many thanks to Alex and Chris for their presentations. Many thanks to Darren, Don, Sam and Darlene for their input during the MOM's Topics. Many thanks to Dave for being there for PAS. We hope to see everyone at the Apr 25 Awards Ceremony which is also a Mom's and a Party! See you there! ***

Ads in PAStimes

Ads in PAStimes run for a month and may be renewed on a month-by-month basis, if submitted by deadline, space permitting. Ads in PAStimes are FREE to members. All others are asked to make a small donation. Donations are to be sent to the Vice Prez who will forward them to the Treasurer.

Paul Wieland to Speak at May 2 Meeting

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renamed Habitation) and a biannual conference. In 1994, his report *Designing for Human Presence in Space: An Introduction to Environmental Control and Life Support Systems* was published as a NASA reference publication (RP-1324). In January 2000, Paul received a call from the White House on behalf of President Bill Clinton, with a request for his views on space exploration in the 21st century. Since responding to that request, he has expanded on his answer, culminating in the publication in 2010, of his book for the general public *Crossing the Threshold: Advancing into Space to Benefit the Earth*. In May 2011 Paul was awarded a gold medal by the Independent Publisher Book Awards, an international competition.

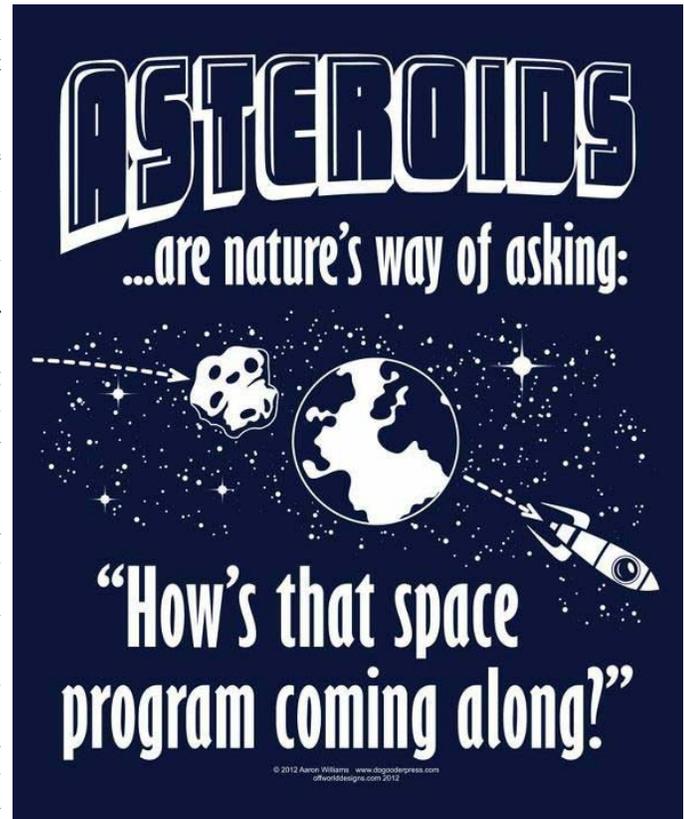
Paul's presentation is named "Space: It's not just a vacuum." The recent asteroid near misses and impacts make clear the importance of space exploration. At the least, they are reminders that we need to pay attention to what is happening in space. But space exploration also provides other benefits, such as: Stretching our technical abilities, Revealing a more accurate view of the universe, Enabling us to do things that were previously impossible, Providing opportu-

nities for cooperation to address our challenges.

And astronauts express a transformed vision of the Earth and share that vision with us. Such an expanded view and understanding is, perhaps, the greatest benefit and reason for space exploration.

Paul writes: I would love to have a book signing. My book retails for \$16.95. I also have t-shirts, as I mentioned, regarding the raffle. The retail price is \$36 (they are screen printed with 10 colors, with an image of the Hubble ultra-deep field on the front and the words "The Future Is Looking Up!" and an image of the cover of my book on the back). A picture of the t-shirt image is on my facebook page: *Crossing the Threshold* (& in this issue of the newsletter). I'll sell the book and t-shirt together for \$40. I

can accept cash or credit card payment. Thanks! §



PAS May 2013 Meeting Pizza Party

By Terri, Event Coordinator

At the May PAS Meeting, besides having an awesome guest speaker, we will be having the annual Pizza Party. If you wish to partake of this yummy goodness, you **must** RSVP by May 2nd at NOON. When you RSVP, you can leave a message by phone or email, or phone text at Events@pasaz.org or 602-561-5398. I need to know how many slices you and what toppings you would like to enjoy. We are doing 1 and 2 topping pizzas.

The pizza is \$1/slice that you will donate to the snack fund in order to cover the costs. Last year, PAS ordered pizza to feed everyone and paid \$130. We took in \$8 towards the snack fund. We didn't make it mandatory to donate to PAS, and we didn't get the return we were looking for. PAS doesn't mind hosting and paying for the pizza if we can collect at least 1/2 the expense back. So, this year, we hope to get back a minimum of 1/2 of \$130 to

cover the costs. You can bring a friend, but please RSVP their pizza too.

Those who RSVP pizza may eat right away, once I arrive with the pizza in hand. ETA of pizza will be no later than 7pm. Those who didn't RSVP are asked to wait until everyone has eaten, then go help yourself to pizza. I'd like to see a donation of 50 cents per slice for the cold pizza.

The pizza we order will be from Sardella's. The plan is: Joe RSVP's 2 slices of pepperoni for himself. His wife Judy RSVP's 2 slices of mushroom. When I order, we will get enough pizza to cover everyone's request, and any extras will be the rest of the pizza. I will do 1/2 pizzas, as well, so if you and your wife want to be 10 slices of pizza total, 5 for you, 5 for your wife, then tell me the 1/2 orders and I will put it in that way. Please do not take more than you RSVP for, until everyone who has RSVP'd pizza gets theirs while it is warm

Once the meeting ends, the pizza is up for grabs, donation requested but not required. And make sure the Speaker gets his share, too Along with the Pizza and awesome guest speaker, we also have the PAS Elections (see article on page 4). Come help elect new blood into the club, or re-elect those lucky, current PAS Officers. All positions are open and available (President, Vice President, Treasurer, Editor, Host, 2 Members at Large), so if you are dying to be part of the PAS officers, please inform Terri so we can be sure you may be voted into office. Come have a tasty, awesome evening with PAS. Bring a snack to share. BYO drink if bottled water isn't what you desire with your pizza. There is a drink machine on campus at the East end of the G-building. Bottled water provided by President Bruce. We are in LS-201 for this meeting. Let's make this a great meeting and super pizza party!

See you there!§

2013 Messier Marathon

By Various Authors

Terri Finch writes: What is the Messier Marathon? For those who have not experienced this awesome event, here is a description of what the Messier Marathon is all about. Straight from Wikipedia: A Messier marathon is an attempt, usually organized by amateur astronomers, to find as many Messier objects as possible during one night. The Messier catalogue was compiled by French astronomer Charles Messier during the late 18th century and consists of 110 relatively bright deep sky objects (galaxies, nebulae, and star clusters). The number of Messier objects visible in any one night varies depending on a few factors, including the location of the observer, the duration of daylight/nighttime, and the season (the positions of the Messier objects relative to the sun varies with the season).

Typically an observer attempting a Messier marathon begins observing at sundown and will observe through the night until sunrise in order to see all 110 objects.

An observer starts with objects low in the western sky at sunset, hoping to view them before they dip out of view, then works eastward across the sky. By sunrise, the successful observer will be observing the last few objects low on the eastern horizon, hoping to see them before the sky becomes too bright due to the rising sun. The evening can be a test of stamina and willpower depending on weather conditions and the physical fitness of the observer. Particularly crowded regions of the sky (namely, the Virgo Cluster and the Milky Way's galactic center) can prove to be challenging to an observer as well.

Chris Johnson writes: I imaged 105 of 110. I could have gotten all 110 but messed up a bit. In Facebook, Chris posts... I've always wanted to try to image the entire marathon in one night. This year, I went with my observatory partner Greg out to the Saguaro Astro event at the Antennas about 85 miles S. of Phoenix. I set up Friday night

and spent the evening running many T-point runs to dial the alignment on my Paramount MX down to under 20 arc seconds. The goal was to shoot 180 second unguided subs on my TOA-150 / ST-4000XCM. The seeing was 1/5. The NOAA site showed such a distorted pattern of the jet stream over Arizona, I knew I was going to have problems. It was so bad that images were distorted bad enough that I was initially blaming hardware. After consulting other imagers at the event, they were experiencing the same issues. I have never seen seeing this bad before. Regardless, I pushed on, after stopping my run and losing a few targets in trying to determine if it was an issue with my setup. I bagged 105 of them. I can't believe I skipped M13 by accident!

Here's the link to the images: http://gallery.cuttinedgeobservatory.com/v/2013+Messier+Marathon.jpg.html?g2_imageViewsIndex=3



Photo Courtesy Chris Johnson

Canyon Springs School Star Party Feb 27

By Leah Sapir

In attendance were Albert Tucker, Don Boyd, Mike Marron and Leah Sapir.

Leah writes: The star party went very well! It was a little cool towards the end, but the sky was beautiful and clear. I arrived around 5:50, and Don, Albert and Mike were already there. Since the Sun didn't set till 6:30, I brought a solar filter and my solar system scale model. The solar filter didn't do much good because the Sun was behind a tree. However, I was able to show some of the kids my solar system model while waiting for the sky to get dark,

and Mike showed them his meteors of course. As soon as it was dark enough, I showed Jupiter and its moons in my scope (6" newtonian dob). All four moons were visible - two on each side. I stayed on Jupiter all night because nobody said that they had already seen it. I understand that by the time I was able to show Jupiter, Don had already switched to star clusters. On occasion, when people asked, I also answered other questions such as what constellations we can see in the sky. A good (and educational) time was had by all.

Don writes: It was a good star party. I got there at 5:30 and Mike was already there eating pizza, Albert arrived a few minutes later and Leah arrived before 6. There was nothing to see until 6:30, when I saw Jupiter, because the moon did not rise until 8:30. It was almost 7 before we could see anything except Jupiter. I did an alignment and showed the double cluster and ET Cluster. They were well behaved and orderly and we were well taken care of. plenty of pizza and one of the teachers delivered water to everybody. ***



Exploring the Water World

In some ways, we know more about Mars, Venus and the Moon than we know about Earth. That's because 70% of our solar system's watery blue planet is hidden under its ocean. The ocean contains about 98% of all the water on Earth. In total volume, it makes up more than 99% of the space inhabited by living creatures on the planet.

As dominant a feature as it is, the ocean—at least below a few tens of meters deep—is an alien world most of us seldom contemplate. But perhaps we should.

The ocean stores heat like a “fly wheel” for climate. Its huge capacity as a heat and water reservoir moderates the climate of Earth. Within this Earth system, both the physical and biological processes of the ocean play a key role in the water cycle, the carbon cycle, and climate variability.

This great reservoir continuously exchanges heat, moisture, and carbon with the atmosphere, driving our weather patterns

and influencing the slow, subtle changes in our climate.

The study of Earth and its ocean is a big part of NASA's mission. Before satellites, the information we had about the ocean was pretty much “hit or miss,” with the only data collectors being ships, buoys, and instruments set adrift on the waves.

Now ocean-observing satellites measure surface topography, currents, waves, and winds. They monitor the health of phytoplankton, which live in the surface layer of the ocean and supply half the oxygen in the atmosphere. Satellites monitor the extent of Arctic sea ice so we can compare this important parameter with that of past years. Satellites also measure rainfall, the amount of sunlight reaching the sea, the temperature of the ocean's surface, and even its salinity!

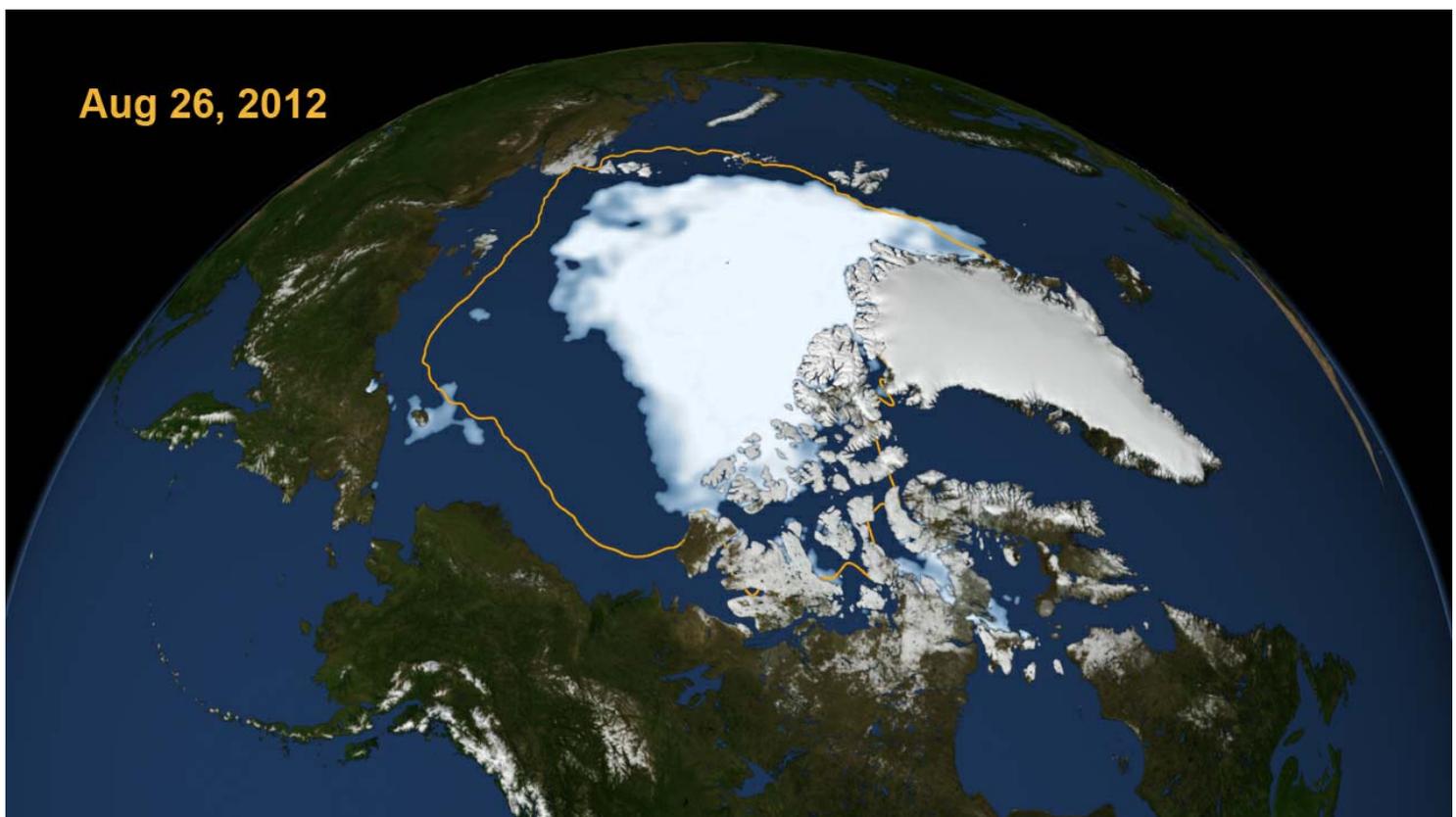
Using remote sensing data and computer models, scientists can now investigate how the oceans affect the evolution of weather, hurricanes, and climate. In just a

few months, one satellite can collect more information about the ocean than all the ships and buoys in the world have collected over the past 100 years!

NASA's Earth Science Division has launched many missions to planet Earth. These satellites and other studies all help us understand how the atmosphere, the ocean, the land and life—including humans—all interact together.

Find out more about NASA's ocean studies at <http://science.nasa.gov/earth-science/oceanography>. Kids will have fun exploring our planet at The Space Place, <http://spaceplace.nasa.gov/earth>.

This article was written by Diane K. Fisher and provided through the courtesy of the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration§



This image from September 2012, shows that the Arctic sea is the smallest recorded since record keeping began in 1979. This image is from NASA's Scientific Visualization Studio at Goddard Space Flight Center.

Arizona Sky

By Leah Sapir



Saturn has just passed its opposition, which means it will be up all night. A great opportunity to spend some time with our ringed friend!

In 1610, when Galileo pointed his telescope at each of the planets, Saturn was a mystery for him: it was not round like Mars or Jupiter, not with phases like Venus, but somehow it seemed elliptically-shaped. He supposed that maybe it had a very close, large moon on each side, or perhaps a pair of “ears” or “handles”. He continued to observe Saturn, and was even more puzzled a few years later, when the side-feature disappeared completely. (However, not to worry – it returned the following year.)

It was only in 1659, when Christiaan Huygens observed Saturn with a more powerful (50x) telescope, that he realized that this “side-feature” was not a moon or “handle”, but a ring extending around the planet. Huygens also discovered Titan, Saturn’s largest moon. In 1859, James Clerk Maxwell determined that the rings could not be solid, but must be composed of many tiny particles.

The reason that the rings had “disappeared” from Galileo’s view is that both Saturn and Earth are tilted relative to the ecliptic, so at different times we see the rings tilted at different angles. About once in 15 years, we see the rings almost edge-on (most recently in August 2009). With Galileo’s low-power telescope, he wasn’t able to see the very-thin rings at all when they were in this position.

Saturn is, in fact, somewhat oval-shaped: its diameter is about 75,000 miles at the equator but 68,000 miles from pole to pole. This is because of its large mass, fluid composition, and rapid rotation. Jupiter exhibits a similar effect, for the same reasons.

Saturn has a very low density: about 0.7 g/cm³, which is about 70% of the density of water, and 1/8 the density of Earth. If you had a bathtub large enough, Saturn would float; but as Phil Harrington has pointed out, it would leave an awful ring... ;)

Like Jupiter, Saturn has a strong magnetic field. While Saturn’s magnetic

field is not as strong as that of Jupiter, it is over 500 times as strong as Earth’s.

Saturn is composed of about 75% hydrogen and 25% helium, with traces of water, methane, ammonia and various minerals. This is similar to the composition of Jupiter, and the original composition of the nebula from which the solar system formed.

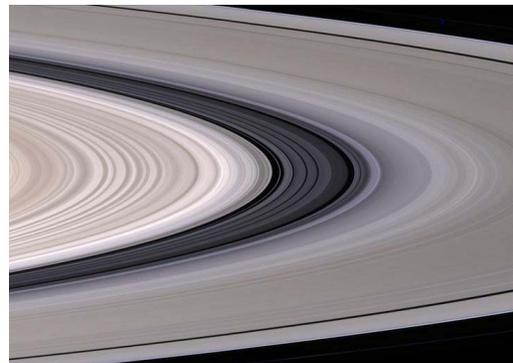
Like Jupiter, Saturn has a core of rock and ice, about the size of Earth, at the center. Saturn’s core has a temperature of about 12,000 degrees C, due to heat from gravitational compression. Saturn radiates about twice as much heat as it receives from the Sun..

The core is surrounded by a layer of liquid metallic hydrogen that goes out to about half the planet’s radius. (Jupiter has a similar layer, which extends out to ¾ of the planet’s radius.) This is a form of hydrogen that is produced only under great pressure, where the protons and electrons are ionized. It conducts electricity, and also produces the planet’s magnetic field.

Above the metallic-hydrogen layer is a molecular hydrogen layer and a hydrogen-helium atmosphere. Winds in the upper atmosphere can reach speeds of up to 1100 mph.

Saturn’s cloud tops show bands like Jupiter’s, but the bands are wider and fainter. They are produced by the winds, combined with heat rising from the interior part of the planet. Various storms, similar to Jupiter’s Great Red Spot, have been seen by Voyager and the Hubble Space Telescope, but they mostly cannot be seen from Earth. However, once in 30 years, when the north pole is tilted towards the Sun (most recently in 1990) white storms can be seen in Saturn’s northern hemisphere. Saturn has fewer storms than Jupiter because it is twice as far from the Sun.

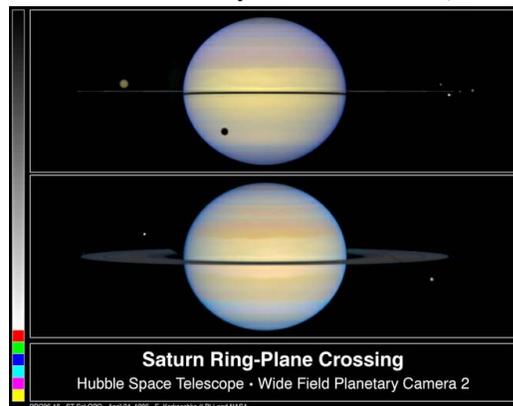
Saturn’s most striking feature, of course, is its rings, extending from 4500 to 50,000 miles above Saturn’s surface. The major rings, as seen from Earth, have been labelled A, B and C. The two outer rings, A and B, are separated by the “Cassini division”, named after Giovanni Domenico Cassini, who discovered this gap in 1675. (He also discovered several of Saturn’s moons: Tethys, Dione, Rhea and Iapetus.) The gap is produced by Saturn’s moon Mimas, via tidal resonance that removes most of the particles from the area between rings



Close-up of Saturn’s rings by Cassini spacecraft, 2004



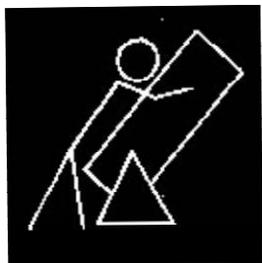
Saturn close-up – composite of pictures from the Cassini spacecraft, 2004 (image credit: NASA/JPL/Space Science Institute)



Saturn Ring-Plane Crossing
Hubble Space Telescope - Wide Field Planetary Camera 2
PRO96-18 - ST ScI OPO - April 24, 1996 - E. Karkoschka (JPL) and NASA
Saturn and some of its moons, imaged by HST in 1996: in upper photo, rings are seen almost edge-on. Titan, on the left, casts a shadow on Saturn. The smaller moons Mimas, Tethys, Janus and Enceladus are grouped near the rings at the right. In the lower photo, the rings are slightly tilted, with Dione at lower right and Tethys at upper left. (image credit: NASA)

A and B. There are several additional rings and gaps, both inside and outside A, B, and C, but these are fainter. The fainter gaps are produced by the moons Atlas, Prometheus, Pandora, and Pan.

The rings are about 170,000 miles in diameter but less than half a mile thick. If all the ring material were compressed into one moon, it would be only about 60 miles in diameter.



Arizona Sky

The particles that compose the rings vary in size from dust specks to boulders 30 ft across, with occasional objects up to a half-mile in size. The particles are about 99% ice. Some are ice-coated rock or “dusty snowballs”. The high reflectivity of the ice is what makes the rings so visible to us.

The ring material is believed to originate either from a moon that disintegrated, or perhaps such a moon never formed, and the original nebular material remained in small particles. The material is supplemented by stray comets and asteroids. It is possible that the current material in the rings is only a few hundred million years old, and must be constantly regenerated.

Saturn has over 60 moons, most of which are very tiny. The largest moons (in order of their distance from Saturn) and their diameters are: Janus (110 miles in diameter), Mimas (245 miles), Enceladus (325 miles), Tethys (660 miles), Dione (700 miles), Rhea (950 miles), Titan (3200 miles), Hyperion (180 miles), Iapetus (900 miles) and Phoebe (140 miles). Titan’s orbit is 760,000 miles from the center of Saturn. Janus, Mimas, Enceladus, Tethys, Dione and Rhea are closer (100,000 to 300,000 miles), and Hyperion, Iapetus and Phoebe are farther out (from 1 to 8 million miles).

Titan is a little larger than Mercury, and is the only moon with an atmosphere: 90% nitrogen and 10% methane.

Saturn orbits the Sun at a distance of 9.5 AU, and takes about 29.5 years to complete its orbit. It rotates on its axis (i.e. one “Saturn day”) in 10.7 hrs.

In the meantime, elsewhere in the solar system - the planets are coming back into view! Mercury will be reappearing as an evening star around midmonth, and by the end of May it will even be up after dark, till around 9 pm. It will remain quite visible in the evening till mid-June and then will start to fade back into the evening twilight.

Venus, too, will be rejoining us as an evening star; at first only in the twilight, but by the end of May it will be up till 8:50 pm, and by the end of June till 9:20.

Jupiter will still be in the west at sunset, but is starting to set earlier: 10 pm at the beginning of May, and 8:30 by the end of the month; and then disappearing into the sunset in June. Saturn, as we’ve already mentioned, is up most of the night, but will gradually start to set before dawn: up till 6 am at the beginning of May, 3:40 at the end of the month, and 1:40 at the end of June.

Uranus and Neptune are morning stars, and starting to rise earlier. Neptune rises at 2:40 am at the beginning of May, 00:50 am at the end of the month, and 10:40 pm at the end of June. Uranus rises about two hours later.

The last time we saw Mars, it was gradually fading into the sunset; now it will start to reappear as a faint morning star in the pre-dawn twilight. It rises at 5:30 am at the beginning of May, 4:40 at the end of the month, and 4 am at the end of June.

With so many planets in the sky, we’re bound to have some interesting choreography.

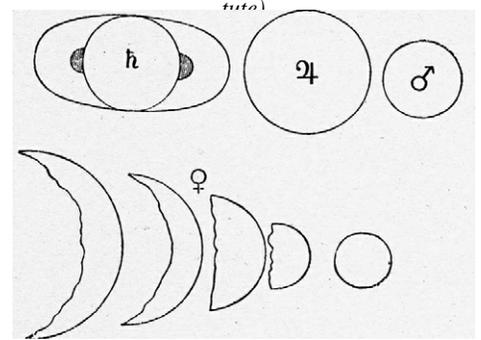
On May 10, Venus and the crescent Moon will be between the Pleiades and Hyades, low in the west after sunset. On May 11 the Moon moves between the Hyades and Jupiter, and on May 12 it is closer to Jupiter. Then on May 16, the first quarter Moon visits the Beehive Cluster in the west from sunset till around midnight. On May 22-23, the full Moon and Saturn cross the sky together from sunset to 4 am.

In the meantime, after May 20, Venus, Mercury and Jupiter will be moving towards a triple conjunction, coming together on May 25 and 26, and then slowly moving apart.

On June 9, the crescent Moon will be between Venus and Jupiter in the west after



Storm on Saturn – imaged by Cassini spacecraft. The main part of the storm measures about 6000 x 11,000 miles; the “tail” extends about 1/3 of the way around Saturn. (image credit: NASA/JPL-Caltech/Space Science Insti-



Galileo's drawings: Saturn's “handles”, Venus's phases, Jupiter and Mars (picture credit: NASA and Istituto di Linguistica Computazionale)

sunset; then on June 10 the Moon will be closer to Venus and Mercury. On June 12, the Moon will be near the Beehive Cluster in the west from sunset to 10 pm.

After June 10, Venus and Mercury will again move towards a conjunction in the west after sunset, reaching their closest point on June 19 and 20. And on June 18-19 and 19-20, the Moon and Saturn will cross the sky together from sunset to 3 am.

Join us next time as we continue to explore the Arizona sky. And wishing you clear skies and happy observing!

Orion's Hidden Treasure

By Leah Sapir

Nestled in the Orion Nebula, and lighting it up, are four small stars known as “the Trapezium”. The official name of this multiple star is Theta-1 Orionis, and the four components are A, B, C 25 and D.

Although these stars might seem “ti-

ny” to us, since they are visible only in a telescope, they are actually powerhouses of energy, much larger than our own Sun.

Star “C” (aka Theta-1C Orionis) is the largest of the group, with 40 times the mass of the Sun. It is a type “O” star that

shines at 200,000 times the Sun's luminosity. The other three stars are about 10 solar masses, and are type “B”. On the scale of spectral types, “O” is the brightest, and “B” is second. The Sun is type “G”, just below the midpoint of the scale. §

CTCA Star Party Mar 26

By Joe Collins

CTCA/PAS Solar Viewing & SkyTour Event Tuesday March 26th, 2013 Report. Report by Joseph T Collins, CancerFighter @ CTCA WRMC & PAS Member PAS attendees: Don Boyd, Albert Tucker and Joe Collins Volunteers: Renee Collins. We had a combined total of eighteen 'customers': CTCA patients, care-givers, and family members join us up on the 5th floor garden terrace for solar viewing, and later for the SkyTour event. We had wind (15mph) and cirrus clouds mixed with haze from the horizon to 30° altitude blocking our view for most of the event. We chose to run the event late (until 1am Wednesday) to be able to view Saturn.

Joe Collins jcollins79@cox.net: I confirmed the solar viewing method on my Celestron C-11 SCT telescope obviating need for a sun-spotter/viewfinder. Don and I did today's solar viewing. Folks looked in Don's scope to see the sunspots on the full solar disc, and then would come over to my scope to view the filamentary structure and umbra of the sunspots at higher magnification. The sun, sunspot-wise, was very quiet this week; we could only see three groups of sunspots. I focused on the largest triple-group of sunspots at AR1704. We were prepared to view comet PANSTARRS (c/2011 L4), but the clouds to the northwest blocked our view during the hour of opportunity after sunset.

All the problems I encountered last event with my CGEM mount were due to a faulty switch discharging my power supply. I stress-tested the CGEM mount for 12 hours prior to the event, recharged my battery supply, and confirmed all was working well at today's event: my telescope slewed fine and viewing availability tonight for patients, caregivers and their guest and family was 7 hours without power failure or interruption. During the SkyTour, I showed customers the lunar surface around Plato crater (thanks Albert for the lunar filter); Jupiter and its moons; Polaris, t-Cassiopeia, Cor Caroli, Tegman, Sirius, Capella, Castor, M42 Orion Nebula; and Saturn and its

moons. I used the new Sky & Telescope 'JupiterMoons' and 'Saturn Moons' iPad applications to identify the moons visible to the telescope, and provide talking points about Jupiter's moons: Ganymede, Callisto, and Saturn's moons: Titan, Rhea, and Europa. The clouds prevented us from viewing many objects that we wanted to show tonight, but it did seem like a good night for viewing binary stars!

Don Boyd dazphotog@aol.com: I showed the sun, moon, Beehive, Jupiter, Saturn, and the Stargate Cluster. I tried for Perseus double cluster and ET but they were both in the clouds and were not even visible. I also showed the double stars Almach (Gamma Andromeda), Castor, and Alcor and Mizar (the six star system in the handle of the big dipper).

Albert Tucker atuk@usa.net: The CTCA-PAS SkyTour event was well received by all the folks attending. We let the weather determine when the event should close. The CTCA facilities manager discussed with us ways to make the lighting more favorable for viewing when the wind removed the light shields that Joe installed. We had a very clear view of the effect created by ice crystals that caused a halo to appear around the moon. Saturn was very popular even though it was obscured by the atmosphere. One guest requested that we show our favorite view, as I was searching for my favorite view on my computer while trying coordinating the target to coincide with a nice opening in the clouds I got the message; "Unable to connect", arg! I was reminded that the night sky training session was coming up soon! Luckily, I could switch back to my hand controller and come up with my favorite view at the altitude that would allow a nice cluster to center in the eyepiece. Again, I thought, night sky training, but what a challenge to star hop when very few stars are visible (at least ones that I could recognize). We had questions from the viewers that demonstrated an interest in astronomy, and some were very interesting. At one point with Joe and Don in a huddle

the answer to a moon riddle was solved by using simple math. Pi*R squared divided by the etc. etc. When I arrived in Anthem after the event my resident timekeeper wanted to know why the late hour? What I didn't say probably worked best.

People- Thanks goes to Jennifer Kehren who provided plenty of copies of our handouts and meal tickets. Thanks to the CancerFighter Group for providing us meals prior to the Skytour event.

Next time- We are looking forward to coming out again next month on Thursday April 25th.

Some helpful Java Scripts from Sky & Telescope: NOTE: you may have to create a username & password and sign in.

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/objects/javascript/saturn_moons Saturn & its 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://www.skyandtelescope.com/observing/objects/javascript/mars> Mars surface profiler

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

http://www.skyandtelescope.com/observing/objects/javascript/satellite_tracker/satelliteChooser ISS/HST/STS Satellite tracker

<http://www.skyandtelescope.com/observing/objects/javascript/3304091.html> Jupiter Red Spot transit Calculator

<http://www.skyandtelescope.com/scop/evalc> Telescope Attribute Calculator ***

Bookmans Telescope Workshop Apr 14

By Terri, Event Coordinator

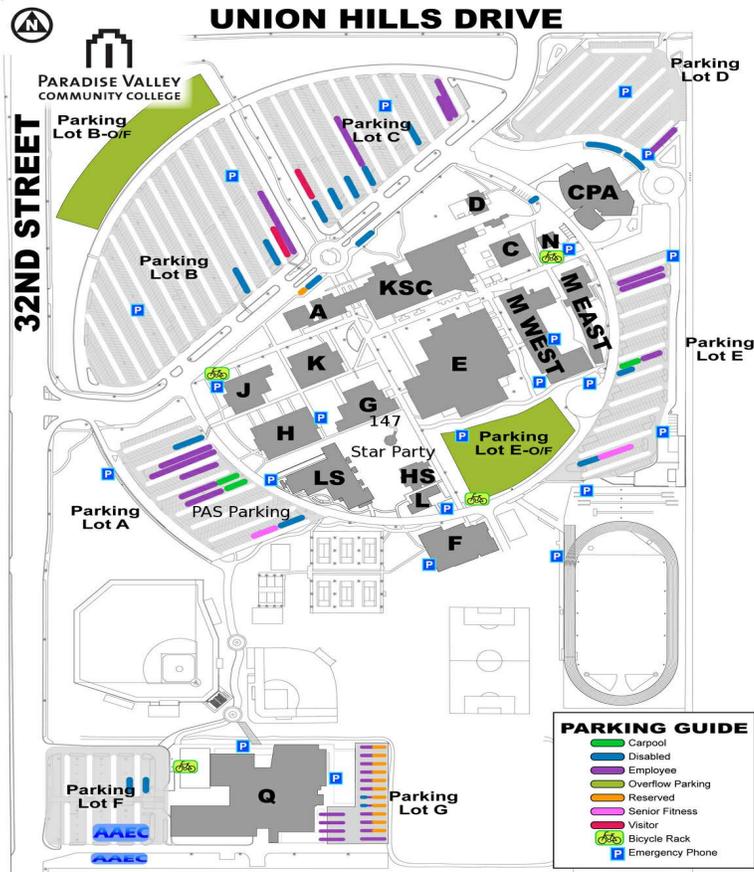
It was a very interesting event. It started out with Don Boyd, William and I arriving and setting up. Earl DeLong joined us. We had 2 RSVP's scheduled to show up. Only 1 did, but we had 2 walk-ins. Lapara arrived with her daughter and their Cele-

stron 127EQ PowerSeeker Telescope. They got there before we were set up. Michael James came to ask questions and Paul also joined us. The event went smooth and Earl was a great help. Michael had a ton of questions and so he sat by the PAS Table

and gathered information from all of us. Lapara didn't have all the parts of their scope, so they left shortly after we began the event. I wish to thank William, Don and Earl for their assistance with this event. We look forward to the next one. See you there!

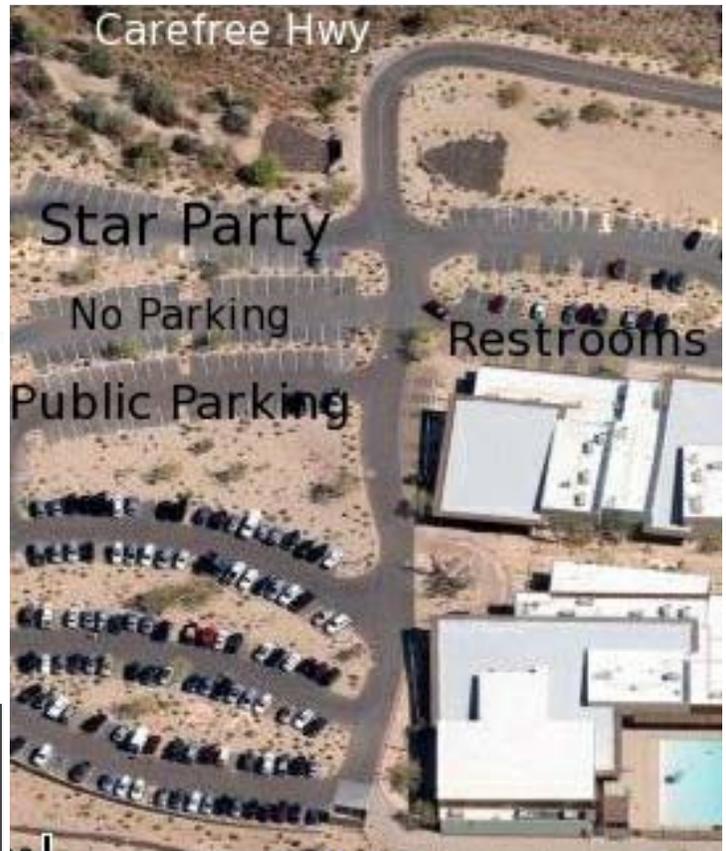
Map of PVCC Main Location

18401 N. 32nd Street | Phoenix, AZ 85032



Map of PVCC Black Mountain

34250 N. 60th Street | Scottsdale, AZ 85266



Photos of Comet Panstarrs

By Terri, Event Coordinator

Did you take an awesome photo of Comet Panstarrs while it was visiting and showing itself to us during March? I would love to include it in the PAS Photo Gallery within the PASaz.org website. I've started an album just for Comet Panstarrs. I'd love for you to take a look at it at this link: http://www.pasaz.org/forums/gallery.php?g2_itemId=13197. I'd like to thank the many PAS Members who contributed their photos of the Comet to make this Comet Panstarrs photo album as interesting as it is. Thanks to John Miller, Steve Machol, & Don Boyd. If you would like your photos added to the photo gallery, email them to Events@pasaz.org. Make a caption that includes the date you took the photo, where you took it from (if interesting location), the equipment you used and any other comments you would like to share about your photo. I will post it as soon as I can. Thanks to all who have contributed. ***

Upcoming Summer Events You May Wish to Attend

We have an awesome lineup of events for the summer months of 2013. Here are a few. Check them out on the PAS Calendar and on Page 2 of this issue of the PAStimes Newsletter.

Bookmans Telescope Workshops: Jun 2, Jun 23, Jul 14, Aug 11.

Non Lecture events at Mike's: NSTS Jun 1, NSTS Jun 8, Perseids Meteor Shower party Aug 10.

Estrella Observatory: Jul 6, Aug 3.

Next CEO in Mayer is Jun 8.

First VSP Training Session is May 25 in Goodyear.

This will be a fun and exciting astronomical summer. Watch for announcements and new events posted to the calendar such as Mike's Lecture Series, VSP's, CEO's and more. We hope to see you at these fun events! ***

Don Boyd
PAStimes Editor
3039 W. Peoria Ave 102-188
Phoenix AZ 85029

To:

2013 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.

Summer Break

Sept 5: Members Night: Sign up to do a mini astronomy related presentation with Terri Events@pasaz.org.

Oct 3: Rick Tejera "Beyond M42 (what to look at after you've found all the easy stuff)"

Nov 7: TBA

Dec 5: TBA + Astronomy Swap Meet ***

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What's Up For May

By Rod Sutter, PAS Past President

Name	Date	Rise	Set
Mercury	05-15-12	05:43	19:43
Venus	05-15-12	06:13	20:19
Mars	05-15-12	05:09	19:047
Jupiter	05-15-12	07:06	21:18
Saturn	05-15-12	17:42	04:49
Uranus	05-15-12	03:24	15:47
Neptune	05-15-12	12:49	12:58
Pluto	05-15-12	22:31	08:51

Planets in bold are visible during evening hours.

May 15 2012

Sunrise: 05:28

Sunset: 19:22



Q3: May 2



New: May 10



Q1: May 18



Full: May 25