BRENDA’S MINUTES

ASSET Minutes
October 14, 2016

We had five visitors. Three adults found us from our website. Chuck brought his grandson, and Frank brought his daughter. If you want a 2017 calendar, you should let Eddie or Will know right away. Our December meeting will be Friday, December 9, at Habaneros (north of Parkdale Mall on the access road). If that doesn’t work out, we’ll use Novrozsky’s, like last year. Sharon reported a good turnout (90 people) at the recent Observe the Moon Night at the Frank Planetarium. Will showed a video taken at the recent All Clubs Astronomy Day at the George Observatory. Frank Simo spent many weekends this past summer visiting observatories in the southwest and showed some pictures as well as historical information about the locations. I presented information about two AL observing programs—Asterisms and the Sky Puppy program. Will is asking that any who are willing pick an AL program and bring it to us at a meeting.

Attendance: 24  Nov. refreshments: Julie
Brenda Tantzen  ASSET Secretary

WILL’S WORDS

Are we already at the end of 2016? Holy cow this year has just flown by. The annual star parties have come and gone but another year lies ahead. I can’t stress enough how powerful astronomy and star parties are, it’s something you have to experience to truly appreciate. Get to a star party and learn the sky with us! Our December meeting will be a dinner and gift exchange at Habanero’s in Beaumont. If you want to participate in the gift exchange, bring a wrapped astronomy related gift of about $10 or so. Everyone always brings cool stuff! We will talk more about it at the November meeting. Don’t forget about calendars. If you want to get on the preorder list please get with me at or before the November meeting. Cost is about $6.50 for the 2017 astronomy calendar. I hope to see you all at the November meeting!! Clear skies and open eyes!  WILL
**Eldorado Star Party at the X-BAR Ranch** - We should have had more there, not just talking about Jane and I, but some of the rest of you. A great time to view the fall “October Skies”. And guess what, there was very good observing weather, which we have not experienced for some time. Here is Will’s quote from the X-Bar Ranch. “Wow. What a year. Every night was as good as the last or better. Not much dew (only one night) and plenty of transparency. I started and logged 42 Planetary Nebulae this week along with several Herschel 2’s.” You just never know when it is going to happen. For our hobby, star parties are what we wait, for and go to, if we can scrape up the bucks. It is not that expensive for a weeks vacation. Anyway I know Will will give you his report. Will, Roger, Lonnie, Doshi and Steve, our adopted observer from Baton Rouge, formed the club group.

**A QUICK REMINDER** - YOU NEED TO EMAIL OR CALL WILL TO GET A 2017 CALENDAR PRE-ORDERED, BEFORE THE NOVEMBER MEETING! ALSO, MARK YOUR CALENDAR FOR THE DECEMBER CHRISTMAS DINNER MEETING, AND FOR EXTRA FUN, PARTICIPATE IN THE GIFT EXCHANGE!

**ASTRONOMY DAY AND ALL CLUBS MEETING** - Will, Bill, Justin, Doshi and Howard & Jane made the All Clubs Meeting at the planetarium in Herman Park. A great turnout for the program to a preview of the new state-of-art, projection system installed there. Will, introduced the ASSET members, and Bill introduced all the Houston clubs, so they did ASSET proud. Also, there was good weather for Astronomy Day at the George Observatory the next evening. Another very good turnout of about 3,500, I heard, since Jane & I didn’t make that. Justin did a couple of talks and other members had their telescopes set up on the observatory deck for public observing. The big highlight is always having the chance to view through the 36 inch telescope.

**AVIATION RADIATION EXPERIMENT IN PROGRESS:**

Many people think that only astronauts have to worry about cosmic radiation. Not so. Regular air travelers are exposed to cosmic rays, too. In October, Spaceweather.com and the students of Earth to Sky Calculus are conducting an experiment in aviation radiation. They are flying from North America to Europe and back again to measure dose rates on international flights that cross the Arctic Circle. Radiation levels in the cabin of the Boeing 767 (Condor flight 2091) tripled within ten minutes after takeoff, and were nearly 40 times ground level by the time the plane reached cruising altitude at 33,000 feet. There was no solar storm in progress. The extra radiation was just a regular drizzle of cosmic rays reaching down to aviation altitudes. This radiation is ever present and comes from supernovas, black holes, and other sources across the galaxy. (taken from spaceweather.com)
A few Astronomy Facts

A nebula (Latin for "cloud"; pl. nebulae,) is an interstellar cloud of dust, of hydrogen, helium and other ionized gases. Originally, nebula was a name for any diffuse astronomical object, including galaxies beyond the Milky Way, until Edwin Hubble showed that they were separate, galaxies are not gas clouds inside the Milky Way.

The Orion Nebula is the closest star forming region to Earth; it lies 1,300 light years away and is thought to be around 25 light years across.

The light of the Pinwheel Galaxy (M101) that you can observe using your telescope has travelled for 21 million years. That's when humans didn't even exist.

Stars have a Life Cycle of stages, and Young Stars in the 1st stage are called protostars

If you could collect all the stars together and put them in piles, the biggest pile, by far, would be the red dwarfs.

Tiangong-1 and Tiangong-2
Do You Know What They Are?

Tiangong-1 means "Heavenly Palace 1") and is China's first prototype space station, serving as both a manned laboratory and an experimental testbed to demonstrate orbital rendezvous and docking capabilities. Tiangong-2 will be their manned space station to compete with the ISS.

The space program of the People's Republic of China is directed by the China National Space Administration (CNSA). Tiangong-1 will likely fall back to Earth, by design, in the second half of 2017, and its demise shouldn't cause problems here on the ground. China has launched its second ever space lab, Tiangong-2 back in September, and is a key part of the nation's plan to have a permanently staffed space station up and running by the early 2020s.

**NASA's Juno Mission Exits Safe Mode**

If you didn't know, the JUNO MISSION TO JUPITER was going right on schedule when on Oct.18th, at a critical time of a rocket burn, the computers slipped into Safe Mode. The rocket burn was to bring the orbit down to its closest approach to Jupiter's surface. While in safe mode Juno missed the burn. On Oct. 24, with confirmation, safe mode was exited. "Juno exited safe mode as expected, is healthy and is responding to all our commands," said Rick Nybakken, Juno project manager from NASA's Jet Propulsion Laboratory in Pasadena, California. "We anticipate we will be turning on the instruments in early November to get ready for our December flyby." Now NASA's Juno spacecraft has successfully completed the minor burn of its thruster engines in preparation for its December close flyby of Jupiter. "We are all excited and eagerly anticipating this next pass close to Jupiter," said Scott Bolton, principal investigator of Juno from the Southwest Research Institute in San Antonio. "The science collected so far has been truly amazing." "With the MWR data, it is as if we took an onion and began to peel the layers off to see the structure and processes going on below," Scott Bolton also said, "We are seeing that those beautiful belts and bands of orange and white we see at Jupiter's cloud tops extend in some version as far down as our instruments can see, but seem to change with each layer." The radiometer instrument can see about 215 to 250 mi. below Jupiter's clouds. (nasa.gov)

**These Twin Craters on the Moon Are My Favorite, Ritter and Sabine**

I want you to check out the detail how crater Sabine was recorded and how a paragraph description can be written in such detail.

"SABINE, - He was an English astronomer & explorer, 1788 –1883. The companion crater to Ritter, 18 miles in dia. with narrow but continuous walls and a low central hill. There are 2 breaks in the NW crest, and a larger break on the NE. On the south crest is a peak, and from this a ridge runs south. East of this ridge are 2 parallel clefts along the border of the Mare. The more southern of these clefts may be traced to Censorinus. North of the central hill is a shallow ring, while on the outer west is a chain of low-rimmed craters.” This is a description from the MOON by Percy Wilkins & Patrick Moore.
Is Proxima Centauri's 'Earth-like' planet actually like Earth
By Ethan Siegel

Just 25 years ago, scientists didn't know if any stars—other than our own sun, of course—had planets orbiting around them. Yet they knew with certainty that gravity from massive planets caused the sun to move around our solar system's center of mass. Therefore, they reasoned that other stars would have periodic changes to their motions if they, too, had planets.

This change in motion first led to the detection of planets around pulsars in 1991, thanks to the change in pulsar timing it caused. Then, finally, in 1995 the first exoplanet around a normal star, 51 Pegasi b, was discovered via the "stellar wobble" of its parent star. Since that time, over 3000 exoplanets have been confirmed, most of which were first discovered by NASA's Kepler mission using the transit method. These transits only work if a solar system is fortuitously aligned to our perspective; nevertheless, we now know that planets—even rocky planets at the right distance for liquid water on their surface—are quite common in the Milky Way.

On August 24, 2016, scientists announced that the stellar wobble of Proxima Centauri, the closest star to our sun, indicated the existence of an exoplanet. At just 4.24 light years away, this planet orbits its red dwarf star in just 11 days, with a lower limit to its mass of just 1.3 Earths. If verified, this would bring the number of Earth-like planets found in their star's habitable zones up to 22, with 'Proxima b' being the closest one. Just based on what we've seen so far, if this planet is real and has 130 percent the mass of Earth, we can already infer the following:

- It receives 70 percent of the sunlight incident on Earth, giving it the right temperature for liquid water on its surface, assuming an Earth-like atmosphere.
- It should have a radius approximately 10 percent larger than our own planet's, assuming it is made of similar elements.
- It is plausible that the planet would be tidally locked to its star, implying a permanent 'light side' and a permanent 'dark side'.
- And if so, then seasons on this world are determined by the orbit's ellipticity, not by axial tilt.

Yet the unknowns are tremendous. Proxima Centauri emits considerably less ultraviolet light than a star like the sun; can life begin without that? Solar flares and winds are much greater around this world; have they stripped away the atmosphere entirely? Is the far side permanently frozen, or do winds allow possible life there? Is the near side baked and barren, leaving only the 'ring' at the edge potentially habitable?

Proxima b is a vastly different world from Earth, and could range anywhere from actually inhabited to completely unsuitable for any form of life. As 30m-class telescopes and the next generation of space observatories come online, we just may find out!

Looking to teach kids about exoplanet discovery? NASA Space Place explains stellar wobble and how this phenomenon can help scientists find exoplanets:

http://spaceplace.nasa.gov/barycenter/en/
**LEONIDS METEOR SHOWER, THE MAIN NOVEMBER SHOWER**  
In 2016, the Leonids are best viewed on the night of November 16th though the morning hours of November 18th. Eager sky watchers who are fortunate enough to have completely clear skies may witness between 15 and 20 meteors per hour. The peak, also known as the time frame for the most intense activity, is anticipated during the early morning hours on November 18, 2016. As one can imagine, the less cloud cover, natural light from the moon, light pollution, and precipitation present, the greater the number of meteors you'll have the chance of viewing.

**Late night November 4 until dawn November 5, 2016, the South Taurids Meteor shower** - is the best night of an extremely long-lasting shower (**Sept. 25 to Nov. 25**), but usually doesn't offer more than about 7 meteors per hour. The Taurids are, however, well known for having a high percentage of fireballs or exceptionally bright meteors. In 2016 the waxing crescent moon will set in the evening early, providing dark skies for the South Taurid meteor shower. The greatest number of meteors should be shortly after midnight on November 5. Remember it'll be possible to catch a fireball!

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**A LITTLE HISTORY OF AMERICAN ASTRONOMY**

**Percival Lowell (March 13, 1855 – November 12, 1916)**

Percival Lowell was an American businessman, author, mathematician, and astronomer who fueled speculation that there were canals on Mars. He founded the Lowell Observatory in Flagstaff, Arizona and formed the beginning of the effort that led to the discovery of Pluto 14 years after his death. In 1894 Lowell chose Flagstaff, Arizona Territory, as the home of his new observatory. At an altitude of over 6,900 feet, with few cloudy nights, and far from city lights, Flagstaff was an excellent site for astronomical observations. This marked the first time an observatory had been deliberately located in a remote, elevated place for optimal seeing. It is 100 years since he died.

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**Examine the Moon’s Terminator**

Observing the region near and along the terminator will reveal a host of fascinating lunar features. There the light comes from the side and the mountains cast long shadows, just as they would here on Earth in the early morning or late afternoon. That’s why brightly lit lunar peaks stand out and the moon appears more rugged. Some of these magnificent mountain ranges rise to more than 20,000 feet.
November brings us a new planet configuration over what we have been used to. The biggie is **Venus** rising higher in the west southwest and is now up a couple of hours after the Sun sets. So the gap from the Sun is now wide enough to view Venus through the telescope, and it is about 3/4 illuminated. **Mercury** is rising near Venus later in the month, around the 23rd, and is in a grouping with Venus and Saturn. Mercury is rising and brighter than Saturn, but best viewed with binoculars, and will continue to be observed till the 1st of December. **Mars** is dimming slowly, and getting smaller which makes seeing the surface features very hard, but still bright up in Sagittarius. Mars is moving eastward so it will stay at the same altitude into winter. Now **Jupiter** is in the morning sky and is high enough to view and will be getting higher as the month goes by. Jupiter is at its farthest from Earth now, and will be closing the gap there to make it slowly getting brighter and larger. Jupiter is not far from Spica in Virgo to its lower left. So you early risers and lovers of Jupiter can start viewing again. **Saturn** in the southwest is a little lower each night and gone by the end of the month. It is still high enough now to get a little viewing in. Well that takes care of the naked eye planets so what’s up with **Uranus, Neptune and Pluto** (I still think of it as a planet). Pluto is too low for any observing, sorry. Uranus is in Pisces and highest in the sky in late evening, that makes it just right to observe. You can use your higher powers on it. Neptune is in good position also. It is in Aquarius after evening twilight ends. All the planets are visible a little sometime during the month, except Pluto. The **Moon** is in its crescent phase the first of November, and is around Saturn & Venus on the 1st and around Mars by the 5th. Over Thanksgiving the Moon will be in its Waning Lunar Crescent phase for early morning risers.