Hawaiian Astronomical Society
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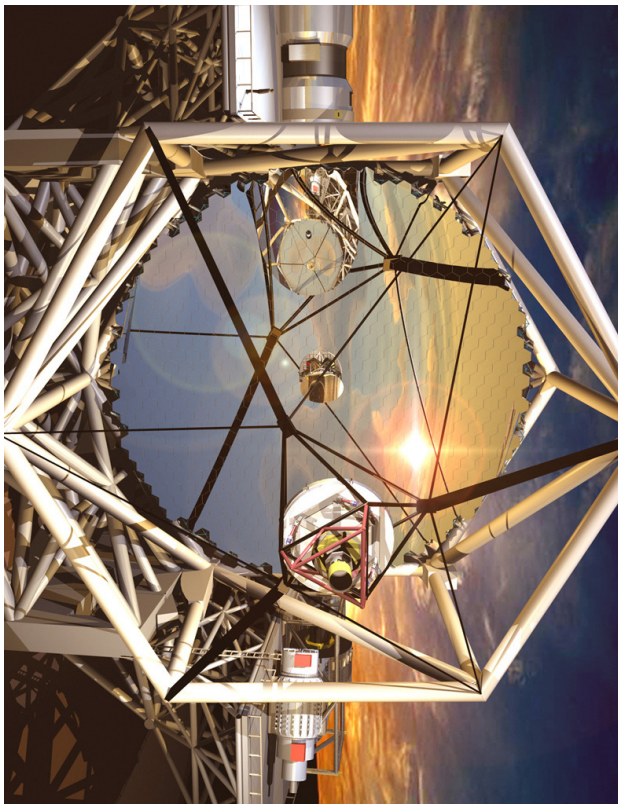

Artist interpretation of the Thirty Meter Telescope (TMT), due to begin construction on Maunakea this year. When completed, TMT will be one of the most advanced and powerful optical telescopes on the planet. One of the leading team members for TMT, Sandra Dawson, has been with the project from the start. Ms. Dawson will speak at the February club meeting.
Courtesy: TMT Observatory Corporation

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The Astronews

HUI KILOLANI

Volume 62, Issue 2

February 2014

www.hawastsoc.org

February GUEST SPEAKER SANDRA DAWSON, Thirty Meter Telescope

SANDRA DAWSON, Manager of Hawaii Community Affairs at the Thirty Meter Telescope (TMT) Observatory will be speaking to our club at the February membership meeting.

"The Thirty Meter Telescope: Reaching Out and Reaching Beyond". TMT will be the world's most advanced telescope, and the first Pacific Rim telescope partnership. It will advance astronomy in the United States, and significantly in Hawaii, continuing Maunakea's role as the one of the world's best places to do astronomy.

TMT has also worked very hard to honor the culture and history of Maunakea, and to bring educational and job opportunities to the state. TMT has been reaching out to the local community; and TMT will reach beyond with an unprecedented suite of science instruments that will enable us to better understand our universe.

☆ ☆ ☆

Before moving to Hawaii five years ago to pave the way for the Thirty Meter Telescope Project, Sandra worked at the Jet Propulsion Laboratory for 20 years on some of NASA's largest projects, to Saturn, Jupiter, and Mars, and received numerous group and individual awards.

Sandra has expertise in environmental policy and legal compliance for science projects and in the communication of technical and legal risks. She has a bachelor of arts degree in political science and a master's in international studies from Claremont Graduate University.

(Continued on page 2)

Inside this issue:

Upcoming Events:

☆The next meeting is 7:30PM on **Tues., Feb 4** at the Bishop Museum.

☆Bishop Museum's next evening planetarium shows are every Saturday of the month at 8:00 p.m. www.bishopmuseum.org/calendar

☆The next Board Meeting is Sun., **Feb 2** at 3:30 p.m. at the POST building at UH.

Up To The Minute:

NSN News

HOORAY! NO TELESCOPE NEEDED:

The Globe at Night program is an international citizen-science campaign to raise public awareness of the impact of light pollution by inviting citizen-scientists to measure their night sky brightness and submit their observations from a computer or smart phone.

Light pollution threatens not only our "right to starlight", but can affect energy consumption, wildlife and health. Nearly 100,000 measurements have been contributed from people in 115 countries during the campaigns each winter/spring over the last 8 years, making Globe at Night the most successful light pollution awareness campaign to date!

This program is open to anyone who can look at the stars and match what they see to a set pictures of selected constellations magnitude charts. All club members can participate since all you need is your vision, about 15 minutes (10 min for eyes to adjust) for observing, and time to submit a simple report.

This year there will be an event each month which will be shown on the club's calendar in the ASTRONEWS with additional information available on the club's Night Sky Network web page. There are six constellations that will be used depending on the date used for observing. Check it out at http://www.globeatnight.org.

Clear Nights,
John

(TMT - Sandra Dawson continued from page 1)

A native of West Virginia, Sandra lives in Hilo with her husband of many years, Dwayne, who is her biggest supporter and helpmate, and is thrilled that her daughters and grandchildren love to visit Hawaii!

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The Astronews is a monthly newsletter of the Hawaiian Astronomical Society. Some of the contents may be copyrighted. We request that authors and artists be given credit for their work. Contributions are welcome. Send them to the Editor via email. The deadline is the 16th of each month. We are not responsible for unsolicited artwork.

John L. Dobson (1915-2014)

Many of you know by now that John Dobson's heart stopped beating on the morning of January 15th. If predictions come true, his mouth will keep moving for some time to come. John's primary "handler" in recent years was Donna Smith, who also manages the affairs of the Sidewalk Astronomers.

Donna reports that when Dobson was admitted to the hospital, only a few days before his last breath, he was asked by Admissions if he was allergic to anything. Donna was standing beside him when John summoned up the energy to reply "The Big Bang." Although Mr. Dobson is most famous for his large, inexpensive telescope style and his passion for sharing the visible universe with "all who want to see", John's primary focus was on cosmology and the unification/consolidation of scientific thinking with spiritual thinking about the universe we inhabit… "because there is only one of these things!"

As you read through articles and memoirs about the #1 champion of amateur astronomy, you will see his life's work sloughed off as "unorthodox view". The word "unorthodox" is significant and telling, because that is a word taken from religion, to describe those who break the rules of a belief system. John's main complaint about The Big Bang was that it constituted a belief system, and Dobson, the Vedanta monk, didn't want cosmology to be infected with blind faith. At an HAS meeting in the mid-'90s, John Dobson stood before us and called The Big Bang "a thing of rags and patches", taking a line from an old song. This riled a number of people in the seats, and whole families in an auditorium at Hawaii Preparatory Academy in Waimea (Big Island) got up and walked out on Dobson when he refused to be the kindly grandpa of amateur aperture, launching instead into a spirited attack on The Big Bang.

Dobson was likewise banned from Stellafane, the nation's largest telescope maker's convention, after giving a 45 minute talk, smartly and succinctly delivered (I was there) on his cosmological ideas versus the contradictory data supporting Big Bang believers. Nobody wants to sit in the pews and have their religion trashed… but Dobson was begging the faithful not to pray to The Big Bang and to consider challenges like his as a test of trueness. This is the scientific method. Religion stifles doubters. Good Science welcomes them. Dobson, the monk, was not trying to eradicate spirituality. Instead, he was committed to combining the best aspects of spirituality with scientific curiosity, so that we all may feel a deep connection to the unfolding nature of the universe, and our place within.

Barry Peckham

(Travel continued from page 3)

of the division of the skies and Chinese astronomy. The movement of the planets and the sun and moon were important because the emperor was the son of Heaven. Muslim scholars were brought in for their experience in using the stars for navigation. There is the history of the influence of Jesuit, Ferdinand Verbiest in the mid 17th century of western astronomy. Luckily, most everything is in English and Chinese. I took pictures so I could go back and read everything from the pictures, otherwise we would have starved to death.

Our taxu driver was waiting for us next door so we were pleasantly surprised to find he had parked in the lot of the hotel/restaurant where we could eat lunch. Best thing on the menu...crispy duck roll with spicy salt; next best thing, lily buds and black fungus. The menu was a picture menu on an iPad. Too cool and very yummy!

John & Joanne

Treasurer's Report

by April Lew

HAS Financial Report for the month ending as of Jan. 15, 2014

Initial Balance:	**$4,204.49**
Income:	
Magazine Payments	98.95
Donations	34.05
Dues Received	389.00
Total Income:	**$522.00**
Expenses:	
Equipment	820.88
P.O. Box Rental	124.00
Total Expenses:	**$944.88**
Final Balance	**$3,781.61**

The club gained seven new members this month. They are ***Glenn Harris, Christian Miller, Charles & Cindy Livermore, Enoy & Thitima Vongsay, and Maurice Chuck Hood.*** A special thanks to ***Maurice Hood, Christian Miller, Enoy Vongsay, Mark S.Watanabe and Kayoko Calef*** for their donations.

Thanks to all members who ***renewed*** their membership this month! A reminder to those whose membership expired at the end of last year. **Check your mailing label for your anniversary date.**

NOTICE:

HAS will publish a complete listing of Club members in the **June 2014** issue of the Astronews. This publication is required by Club by-laws, Article III, Section 2 Para C(e) and Article VIII, Section 1B. Unless notified otherwise, this list will include all member's names, mailing addresses, and phone numbers. If you wish to have some or all of your data excluded, please notify the Club Treasurer, ***April Lew*** before **May 15, 2014**.

Please be advised that this listing is intended for Club members' personal use only in contacting one another. It is not to be used for any commercial or solicitation purposes. With the exception of our membership in the Astronomical League, HAS does make this list available to, nor do we sell its contents to anyone for any purpose. Please respect our member's right to privacy.

Member information is not to be republished, redistributed, or used for any commercial or solicitation purposes.

President's Message

by Chris Peterson

Since we are having a talk on the 30-meter telescope this month, I decided to do a little research on Wikipedia to satisfy my curiosity about the history of optical telescope sizes. Galileo held the early record. His 0.62" refractor from 1609 was followed by a 1" in 1612 and a 1.5" in 1620. This record held until 1638 when Johannes Hevelius's 2.3" refractor took over, followed by his 4.7" in 1645.

Sir Isaac Newton built the first reflecting telescope (using speculum metal, mostly copper and tin) in 1668, but its mirror had a diameter of only 1.3". His Newtonian design, however, remains popular even today. Robert Hooke produced a 7" reflector in 1674. This was a Gregorian type, sort of an early long-focal-length Cassegrain.

Christiaan Huygens produced long-focal-length refractors of 7.5", 8", and 8.5" in 1686. Gregorian reflectors took the next few records. James Short produced a 14" in 1734 and a 19.5" in 1750, followed by Father Noel's 23.5" in 1761 and Rev. John Michell's 29.5" around 1780-1789.

William Herschel's famous 40-foot focal length off-axis reflector had a mirror of 49.5" diameter and was built in 1785-89. The last speculum metal mirror to take the lead, and the last private telescope to be the world's largest, was the Rosse six-foot telescope, otherwise known as the "Leviathon of Parsonstown", with a diameter of 72". It was built by William Parsons, the 3rd Earl of Rosse, in Ireland in 1845.

The modern era of glass mirrors with metal coatings housed in observatories funded by multiple people or organizations owes much to George Ellery Hale. He founded the Yerkes Observatory in Chicago and had Alvan Clark produce a 40" refractor for it. Later he founded Mount Wilson Observatory in California. The 60" Hale Telescope was followed by the 100" Hooker Telescope that took the title of world's largest in 1917. The original silver coating was replaced by aluminum in 1935, bringing us to the mirror design still most commonly used.

Chris

Astro-Travels

by John Sandor & Joanne Bogan

China, 2013

Another astronomy destination with the double benefit of a great restaurant next door. What a find!

It really is a good idea to have the addresses of places you want to visit written in Chinese so the language barrier isn't an issue with your taxi driver. The lobby of our cute hotel in the old section of Beijing had a rack of cards with lots of tourist destinations written on them in English and Chinese. The staff spoke perfect English and they were very helpful with all the logistics of our visit. There was also a great fruit stand at the one end of our alley and a nut vendor at the other end. There was a hot onion bread vendor in the middle. It was kind of perfect. The Double Happiness Hotel not far from the Forbidden City. ***www.hotel37.com/EN/***

Make sure you go to the Observatory in time so you can have lunch right next door.

The observatory building itself is about fifty feet high and not sure what is inside it. The cool old instruments are on the top and visible from the ground. There is a long staircase on two sides of the outside of the building so you can easily climb to the top. Various armilarry spheres, sextants, sundials, and quadrants all made of brass are displayed with signs describing them. The walk around the grounds outside has more instruments and signs describing their use.

In the next courtyard the buildings surrounding the courtyard showcase the concepts

(Continued on page 11)

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

Globular Cluster NGC 6397. Some of the oldest stars in the universe can be found in what are known as globular star clusters—ancient relics of the early universe formed when some nascent cosmic clouds were too small to collapse in on themselves. Yet within these clusters of ancient stars lies a sprinkling of very young stars. *Credit: ESA & Francesco Ferraro (Bologna Astronomical Observatory) / NASA, Hubble Space Telescope, WFPC2.*

(Space Place continued from page 4)

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.

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. ☆

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration

Australia is an ideal location from which to observe the α-Centaurids as evidenced by this wonderful image by a National Geographic photographer taken in the outback. *<See Meteor Report by Tom Giguere on page 5>*
Image courtesy: National Geographic

List View | Past Events | < February 2014 > | Upcoming Events | Add/Log Event

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1 6:00 PM Public Star Party(D) Sunset: 6:24 PM
2	3	4 7:30 PM Club Meeting	5	6	7 6:30 PM Waikiki Elem SP	8 6:38 PM Public Star Party(G) 6:37 PM Public Star Party(K) Sunset: 6:28 PM
9	10	11	12	13	14	15 Sunset: 6:31 PM
16	17 Washington's Birthday	18	19 7:00 PM Star Party Mil Ike 8:00 PM Globe at Night	20 8:00 PM Globe at Night	21 8:00 PM Globe at Night	22 8:00 PM Globe at Night 6:45 PM Club Star Party (D) Sunset: 6:35 PM
23 8:00 PM Globe at Night	24 8:00 PM Globe at Night	25 8:00 PM Globe at Night	26 8:00 PM Globe at Night	27 8:00 PM Globe at Night	28 8:00 PM Globe at Night	1

<<Upcoming Star Parties>>

Public Party-Dillingham	**Feb 01 (Peterson)**
Kahala/Ewa Public	**Feb 08**
Club Only-Dillingham	**Feb 22 (West)**

Upcoming School Star Parties

Fri.	**02/07**	Waikiki Elementary (Waikiki)
Wed.	**02/19**	Mililani Ike Elementary (Mililani)
Fri.	**03/07**	Niu Valley Middle (Honolulu)
Thurs.	**03/20**	Hawaiian Cultural Program (Kaneohe)

Meteor Log

by Tom Giguere

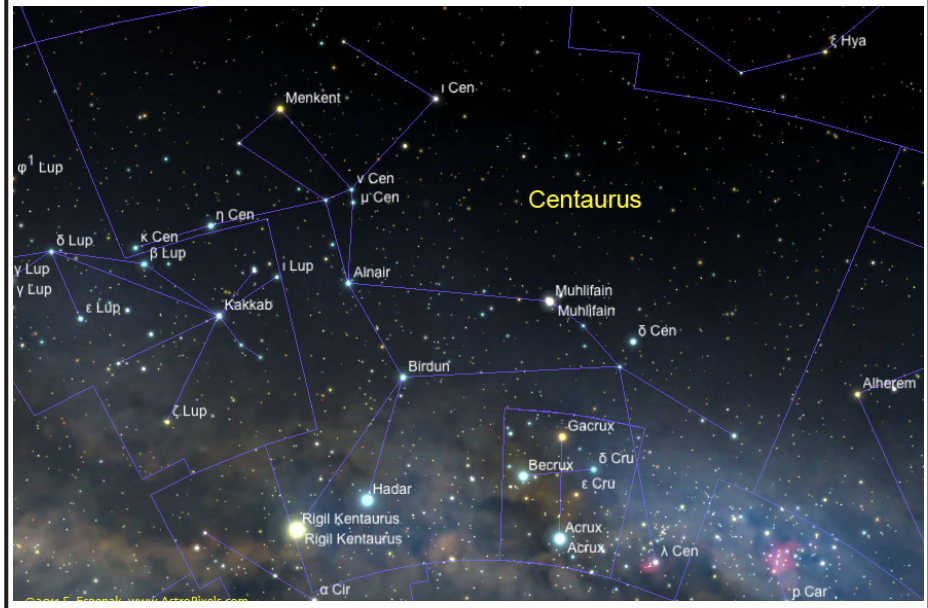
The Quadrantid peak on January 3rd coincided with a two day Moon which is ideal. The weather was mostly clear with just occasional clouds and one minor rain shower at our viewing location on the beach at Barbers Point. Our primary mission on this outing was camping so we probably did more looking down at the campfire, rather looking up at the nice skies. Despite the loss of focus we did see a number of Quadrantid meteors. Multi-tasking can work and the S'mores were tasty as well!

The nine day old moon is a partial factor when viewing the very southerly α-Centaurids (ACE) this month. With the moon setting after midnight, the best viewing would be after 2am. This shouldn't be inconvenient, even for those of us in the working world, as the peak falls on Saturday morning. Of course, this is a shower with a relatively low ZHR (zenith hourly rate), so a little extra motivation may be required. One big motivation is the pleasure in seeing a bright meteor. This shower has been known to produce very bright meteors over the years, sometimes brighter than magnitude -3 and the meteors produce persistent trains. Could be fun…

MOON PHASES

First Quarter	*Full Moon*	*Last Quarter*	*New Moon*
Feb 06	**Feb 14**	**Feb 22**	**Mar 1**

Shower	Activity	Max Date	λ 2000	Radiant α	Radiant δ	V∞ km/s	*r*	ZHR
Centaurids (ACE)	01/28 - 02/21	Feb 08	319.2°	210°	-59°	56	2.0	6



Keep looking up! ***Tom Giguere***, 808-782-1408, ***Thomas.giguere@yahoo.com***
Mike Morrow, PO Box 6692, Ocean View, HI 96737

Observer's Notebook

by Jay Wrathall

Planets Close To the Moon

Times are Hawaii Standard Time

Feb 1, 01h, M 1.1° NNW of Neptune
(22° from sun in evening sky)

Feb 3, 12h, M 2.6° NNW of Uranus
(55° from sun in evening sky)

Feb 10, 19h, M 4.9° S of Jupiter
(139° from sun in evening sky)

Feb 19, 12h, M 3.0° SSW of Mars
(124° from sun in morning sky)

Feb 21, 12h, M 0.32° S of Saturn
(100° from sun in morning sky)

Feb 25, 19h, M 0.2° N NW of Venus
(44° from sun in morning sky)

Feb 27, 10h, M 2.8° NNW of Mercury
(21° from sun in morning sky)

Other Events of Interest

Times are Hawaii Standard Time

Feb 2, Groundhog day -
(Half way between winter solstice and vernal equinox)

Feb 11, 13h, Venus Brightest
(magnitude -4.6)

Feb 14, 13:54h, Moon Full

Feb 15, 10h, Mercury at inferior conj. with sun (Passes into morning sky)

Feb 21, 17 h, 2 Pallas at opposition

Feb 23, 08h, Neptune at conjunction with sun (Passes into morning sky)

Feb 28, 20:02h, New Moon

☿ Mercury

Mercury is visible in the evening twilight early in February and in the morning twilight late in February.

♀ Venus

Rises rapidly in the morning sky, reaching maximum brightness of -4.6 mag. on Feb 11.

♂ Mars

Rises before midnight, rapidly brightening and increasing in apparent diameter as it approaches opposition in April. Mid-month diameter 10", magnitude -0.2.

♃ Jupiter

Reached opposition on January 5 and shines brightly most of the night at about magnitude -2.4.

♄ Saturn

Saturn rises about 2:00 am and is visible in the morning sky in the pre-dawn hours.

♅ Uranus

Uranus is is low in the southwest at sunset.

♆ Neptune

Reaches conjunction with the sun on Feb 23. Might be viewed with difficulty when near the moon on Feb 1, but after that it will be too close to the sun to observe.

♇ Dwarf Planet Pluto

Pluto was at conjunction with the sun on Jan 1 and is still too close to the sun for easy viewing of this very dim dwarf planet.

⚴ Asteroid 2 Pallas

Reaches opposition on February 21 at magnitude +6.3.

Meeting Minutes

by Gretchen West

President Chris Peterson called the Jan. 7, 2014 meeting of the Hawaiian Astronomical Society to order at 7:35PM. The meeting was held in the Planetarium on the grounds of the Bishop Museum. There were 32 individuals in attendance.

FYI: ***Chris Peterson*** began this month's meeting by thanking long time member, participating enthusiast, and retiring H.A.S. Board member ***Jim MacDonald f***or his many years of dedicated service to our club as club treasurer. Chris also thanked retiring Vice President ***Leslie Galloway*** and At-Large representative ***Sue Girard.***

Chris Peterson introduced the newly elected H.A.S. Board members to the general membership assembled. They are: Vice President, ***Peter Besenbruck***; At-Large Representative- ***Otis Ann Wikman*** and At-Large Representative - ***Charles Rykken***

Chris also acknowledged returning Board members: President – ***Chris Peterson***; Treasurer – ***April Lew*** (who is stepping into this spot from her former spot as an At-Large representative); Secretary – ***Gretchen Wes***t; Astronews Editor – ***Carolyn Kaichi***

Hawaii Space Lecture Series: This month's lecture is scheduled for Jan. 28, 2014, Larry Denneau the chief software engineer for the Atlas (Asteroid Terrestrial Last-Alert System) mission at the UH Institute for Astronomy. He will be speaking on "Atlas- Saving the World from Asteroid Impacts." Regular lectures usually take place in room 544 in the POST Building on the Manoa campus of the University of Hawaii. Contact NASA PRPDC at 808-956-3132 or go to http://www.higp.hawaii.edu/prpdc.

Club Purchase: The club has purchased a new digital projector and speakers for use in the Planetarium. ***April Lew and Gretchen West*** made the purchase at a cost of $787.00. The cabinet has permission to be installed in the Planetarium storage area.

The Board has has also approved the purchase of a table covering printed with the club's name and logo. ***Gretchen West*** has selected Custom Table Covers as the online purveyor.

Permits: H.A.S. has received the 2014 permit for use of Dillingham Airfield.

Missions: ***President Chris Peterson*** reported on various missions:

ISS passes on the mornings of Jan. 5th and 6th. There was a general sharing of information about programs and Apps for cell phones.

NASA's Mars rovers celebrate a 10-year anniversary this year.

Chinese Mission Chang An landed on the Moon in the Bay of Rainbows on Dec. 14, 2013. The landing of their rover Yutu or "Jade Rabbit," was the first soft landing on the Moon for 37 years.

Guest Speaker: Walter Murawski shared information and pictures of the world of Danish astronomer Tycho Brahe, known for his accurate astronomical and planetary observations. Tycho Brahe's precise measurements supported the Copernican system and showed that comets were celestial objects, not atmospheric phenomena. Upon the death of King Frederick II, Brahe lost favor with the new king, Christian IV, who withdrew his support and funding.

Planetarium: ***Joanne Bogan*** provided members with a tour of wayfinding Hawaiian style. their way across the Pacific.

As there was no further business, the meeting was adjourned at 9:12PM. Refreshments were supplied by member ***Charles Rykken***.

Respectfully Submitted,
Gretchen West
HAS Secretary