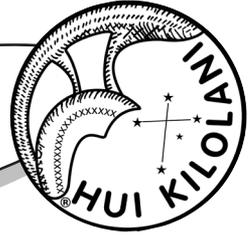


The Astronews



Volume 60, Issue 7

July 2012

www.hawastsoc.org



Too Much of a Good Thing?

Recently I made the mistake of asking of pictures of the Venus transit for the newsletter. I received more than I could possibly use in one issue so you may see random images popping up in the next few months. Thanks to all photographers who responded.

This image is courtesy of our "Meteor Guy" Tom Giguere, taken from Barber's Point, 5Jun12.

Editor 

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Upcoming Events:

☆ The next meeting is 7:30PM on **Tues., Jul 3** at the Bishop Museum Planetarium.

☆ Bishop Museum's next planetarium shows with **Barry Peckham** are Friday, **Jul 6 & 20** at 8:00 p.m.

www.bishopmuseum.org/calendar

☆ The next Board Meeting is Sun., **Jul 1** at 3:30 p.m. at the POST building at UH.

The Hawaiian Astronomical Society is now on

facebook



VOYAGER 1: PUSHING THE ENVELOPE

Voyager 1, after 35 years in space, is approaching the limits of the solar system. Scientists have detected signs that Voyager 1 is at the edge of the heliosphere, the magnetic “bubble” that surrounds the sun and planets of our solar system neighborhood.

The bubble is generated by our sun’s magnetic field, and inflated by the solar wind. As Voyager approaches the limits of that field, the number of cosmic particles hitting the little spacecraft increases. These cosmic rays are high energy particles such as protons and helium nuclei accelerated to near-light speed by distant supernovae and black holes.

The heliosphere protects our solar systems from these deadly subatomic stream, deflecting and slowing the particles before they reach in inner planets, otherwise life as we know it would have had a hard time evolving.

Although not a strictly defined barrier, the distance between our sun’s magnetic protection and interstellar space is around 18 billion kilometers from Earth.

As Voyager 1 leaves its home solar system, other changes will become evident. Particles generated by our own sun will decrease dramatically, and the sun’s magnetic influence will switch to the uncharted magnetism of interstellar space.

Meanwhile, Voyager 2 is pacing behind it’s companion. Both spacecraft are in good shape, considering their age and the harsh environment they have endured for the last 3.5 decades.

Although surrogates, the two Voyagers represent our virtual reach for the stars, as they carry with them the voices and dreams of humanity.

(see related image on page 11)



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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.

We have a new space telescope in orbit. This one is called “NuSTAR” which is short for “Nuclear Spectroscopic Telescope Array”. It was launched on June 13th and is scheduled to spend two years producing images using high energy X-rays. According to the mission website, its primary objectives are to:

1. take a census of collapsed stars and black holes of different sizes by surveying regions surrounding the center of our Milky Way Galaxy and performing deep observations of the extragalactic sky;
2. map recently-synthesized material in young supernova remnants to understand how stars explode and how elements are created; and
3. understand what powers relativistic jets of particles from the most extreme active galaxies hosting supermassive black holes.

X-rays are difficult to focus for the same reason that they are useful in medicine – they penetrate many materials. An ordinary mirror won’t work. X-ray telescopes use a nested series of mirrors stacked like ice cream cones (the pointy-bottomed kind). The mirrors are almost parallel to the incoming X-rays which hit the mirrors with such a low “grazing incidence” angle that they bounce off instead of going through. NuSTAR uses a stack of 130 mirror shells for each of the two detectors that will record the photons.

Each detector is surrounded by materials that will record high-energy photons and cosmic rays that come from other directions and hit the detectors so that they may be subtracted from the total. It would be too difficult to prevent them from reaching the detectors since they are so efficient at penetrating any shielding.

The black holes and other objects that NuSTAR will observe are often surrounded by a lot of dust that is hard to see through. The X-rays will penetrate that material and give us new insight into the processes occurring there.

Science advances in many ways, but one of the most common is through the acquisition of new data. NuSTAR will improve the sensitivity, spatial, and spectral resolution in the X-ray data by factors of 10 to 100 compared to previous missions. That will surely lead to greater understanding of these interesting objects.

Chris



Star Party Report

by Sue Girard

Club Star Party Report - Sat June 9th, 2012

The Club Star Party was pretty much a ‘clear sky between clouds’ event for the entire evening. The turnout was light with only about 10 folks showing up. The termites left us alone this time so we could enjoy all of our old favorites and some new ones as well. Of course Saturn was stunning, and is at it’s best right now. My favorite glob (Omega Centauri) was very sharp and well-placed for viewing right now and I watched it sink into the Waianae mountains. I jacked the power up to get a really good look at the center and the myriad of stars overwhelmed the view!

It’s the best time for galaxies now and they didn’t disappoint. The Big Dipper is high (for us here in Hawaii) in the sky, so all of it’s treasures were there to delight. Scorpius and Sagittarius are rising, so there’s a wealth of globulars and clusters to behold in that area. Barry and Paul found that really nice little green planetary in “Poniatowski’s Bull”. Vega and Lyra are rising, so we checked out the Ring nebula (again I jacked up the power and the Ring filled the entire field of view!). T Lyrae surprised us with it’s lovely cherry red hue. Again, the weather held out, so some of us stayed until midnight and weren’t disappointed.

(Continued on page 9)

How Many Discoveries Can You Make in a Month?

by Dr. Tony Phillips

This year NASA has announced the discovery of 11 planetary systems hosting 26 planets; a gigantic cluster of galaxies known as “El Gordo;” a star exploding 9 billion light years away; alien matter stealing into the solar system; massive bullets of plasma racing out of the galactic center; and hundreds of unknown objects emitting high-energy photons at the edge of the electromagnetic spectrum.

That was just January.

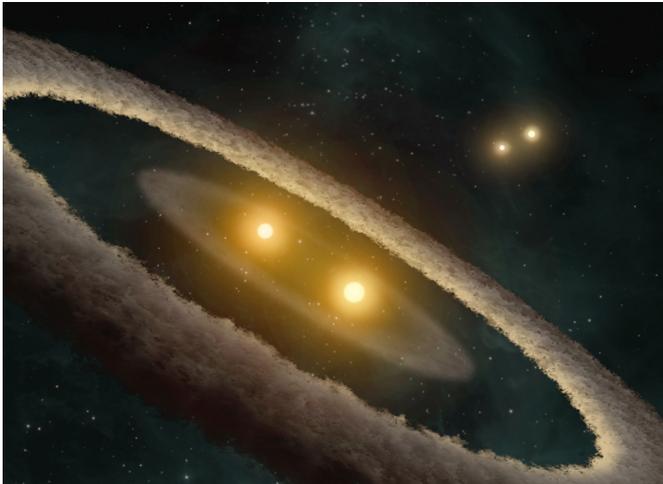
Within NASA’s Science Mission Directorate, the Astrophysics Division produces such a list nearly every month. Indeed, at this very moment, data is pouring in from dozens of spacecraft and orbiting observatories.

“The Hubble, Spitzer, Chandra, and Fermi space telescopes continue to make groundbreaking discoveries on an almost daily basis,” says NASA Administrator Charlie Bolden. (Bolden made these statements in an April 20th editorial he co-authored with John Holdren, Director of the Office of Science and Technology Policy: http://blogs.nasa.gov/cm/blog/bolden/posts/post_1334967201693.html)

NASA astrophysicists and their colleagues conduct an ambitious research program stretching from the edge of the solar system to the edge of the observable Universe. Their work is guided in large part by the National Research Council’s Decadal Survey of Astronomy and Astrophysics, which identified the following priorities:

- Finding new planets—and possibly new life—around other stars.
- Discovering the nature of dark energy and dark matter.
- Understanding how stars and galaxies have evolved since the Big Bang.

(Continued on page 9)



Artist’s concepts such as this one are based on infrared spectrometer data from NASA’s Spitzer Space Telescope. This rendering depicts a quadruple-star system called HD 98800. The system is approximately 10 million years old and is located 150 light-years away in the constellation Crater.

Credit: NASA/JPL-Caltech/T. Pyle (SSC)

July 2012

There are three minor showers in July that can be observed late in the evening/ early-morning to minimize moonlight. With the three shower maximum so close together, it's really a three for the price of one show.

The Piscis Austrinids (PAU) shower is under observed, thus not much is known about it. We have a chance to add to the body of knowledge for this southerly shower.

Remember, if you plan to submit observations it is good to document the details of where and when (time) you observed.

Full Moon
July 3

Last Quarter
July 11

New Moon
July 19

First Quarter
July 26

Shower	Activity	Max Date	λ 2000	Radiant α	δ	V_{∞} km/s	r	ZHR
Piscis Austrinids (PAU)	7/15 - 8/10	Jul 27	125°	341°	-30°	35	3.2	5
South δ -Aquiriids (SDA)	7/12 - 8/23	Jul 29	127°	340°	-16°	41	3.2	16
α -Capricornids (CAP)	7/03 - 8/15	Jul 29	127°	307°	-10°	23	2.5	5

If you catch a falling star – please submit your observations!
Tom Giguere, 808-782-1408, Thomas.giguere@yahoo.com
Mike Morrow, PO Box 6692, Ocean View, HI 96737



HAS T-Shirts \$15!

(see Jim MacDonald)

- Light Blue Only

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Planets Close To the Moon

Times are Hawaii Standard Time

July 6, 23h, M 5.8° NNW of Neptune
(133° from sun in morning sky)

July 9, 18h, M 5.0° NNW of Uranus
(100° from sun in morning sky)

July 14, 16h, M 0.81° WNW of Jupiter
(46° from sun in morning sky)

July 15, 07h, M 3.9 N of Venus
(40° from sun in morning sky)

July 24, 11h, M 4.0° S of Mars
(69° from sun in evening sky)

July 25, 07h, M 5.7° S of Saturn
(81° from sun in evening sky)

Mercury is closer than **15°** from the sun when near the moon in July

Other Events of Interest

Times are Hawaii Standard Time

July 3, 08:51h, Moon Full

July 4, 17h, Earth at Aphelion
(farthest from sun - 1.017 au from sun)

July 9, 04h, Venus 0.91° WNW of Aldebaren (38° from sun in morning sky)

July 10, 10h, Venus Brightest
(Magnitude -4.5)

July 18, 18:34h, Moon New

July 28, 10h, Mercury at inferior conj with sun (Passes into morning sky)

<p> Mercury</p> <p>Mercury reaches greatest elongation at the beginning of the month and is visible in the dawn sky early in the month.</p>	<p> Venus</p> <p>About 45° from the sun in the morning sky and reaches greatest brightness of -4.5 mag on July 10.</p>	<p> Mars</p> <p>Mars is still visible in the southwest during the early evening hours.</p>
<p> Jupiter</p> <p>Is very close to Venus at the beginning of the month in the morning sky. Look for them near the moon on July 14.</p>	<p> Saturn</p> <p>Saturn shines brightly in the evening sky in the southeast.</p>	<p> Uranus</p> <p>Uranus rises before midnight and can be viewed before dawn.</p>
<p> Neptune</p> <p>Neptune is in the morning sky, rising before midnight.</p>	<p> Dwarf Planet Pluto</p> <p>Reached opposition on June 29. This is a good month to view this minor planet. About 1.3° from the moon on July 30.</p>	<p> Asteroid 3 Juno</p> <p>Still in the sky most of the night after reaching opposition in the middle of May.</p>

President Chris Peterson called the June 5, 2012 meeting of the Hawaiian Astronomical Society to order at 7:37p.m. The meeting was held at the Planetarium on the grounds of the Bishop Museum. There were thirty-two members and two visitors in attendance.

Transit of Venus: Mike Shannahan, Director of Education, Exhibits and the Planetarium for the Bishop Museum, dropped by to thank the astronomers of Hawaiian Astronomical Society for their help while sharing the Transit of Venus with the visiting public. The sunburned group of H.A.S astronomers, some of whom spent seven-plus hours in the baking Hawaiian sun, included : **Leslie and Peter Galloway, John Sandor, Joanne Bogan, Sue Girard, Jim MacDonald, Peter Besenbruch, Gretchen West, Paul Lawler, Stephanie Choquette (here from Canada), Barry Peckham, Chris Peterson, April Lew,** and mainland visitor/H.A.S. member, **Walter Murawski**. Former member and good friend of H.A.S., Nicolas Bradley, joined old friends and manned a telescope most of the day to help out. There to give their moral support were members **Clair and Mel Levin, and Ken Elliott**. At the evening general membership meeting, everyone fairly glowed and lit up the planetarium, either from an endorphin high or absorbed solar radiation.

Dillingham Airfield Reminder: We want to remind all members of the need to sign in with that night's Board member In-Charge for all who would like to join us at Dillingham Airfield for our dark sky star parties. The Club Board member In-Charge will have a nightly Sign-in/Visitor's log. Information to be on the sign-in sheet includes the car's make and license plate number, driver's name, and the number of people in the car. All exits will take place through the Dillingham Airfield West Gate. There are schedule exit times and visitors should ask the Board member In-Charge about the times when you arrive and sign-in.

H.A.S. is concerned by the large number of visitors to our public star parties. The large crowds have the potential to cause entrance and exit problems, driving on the airport taxi-way, and improper parking of cars at the hanger/bathroom areas. The H.A.S. Board will monitor the number of visitors and may consider restrictions to control our on-site numbers so as to not endanger our use of the Dillingham Airport site.

We will also amend the information on our website to remind visitors to the rules: NO DOGS, NO CIGARETTES, & absolutely NO ALCHOLIC BEVERAGES!!!

Review: **Chris Peterson** inquired of the assembled members how many had gotten out of bed early Monday morning June 4th to view the partial lunar eclipse. Many indicated that there were cloudy conditions, while one or two reported good viewing. **John Sandor** reported that he viewed the Annular Solar Eclipse in Reno, May 20, 2012. John drove one hour out of Reno to a viewing site and said the view was great.

Star Party Report: Star Parties were rather soggy during the month of May. Dillingham Airfield events had to be cancelled due to wet weather. **John Gallagher** reports that as of this date we no school star parties scheduled until September.

Membership Roster: The club membership roster was printed in the June ASTRO-NEWS.

Astronomical League: **Travis Le** is the recipient of another award from the Astronomical League of the Pacific. He will be invited to attend the next general membership meeting.

International Space Station: The membership adjourned to the viewing platform atop the Planetarium building to view the passing International Space Station. Happy and excited chatter passed time as we awaited the ISS. Despite a few clouds, a brilliant ISS made a graceful arc overhead passing from southwest to northwest amid

(Continued on page 11)

Hawaiian Astronomical Society

Event Calendar

List View		Past Events		< July 2012 >		Upcoming Events		Add/Log Event	
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday			
1		2 7:30 PM Club Meeting 7:30 PM Sky and Space class Final (PENDING)	3 Independence Day	4	5	6	7		
							Sunset: 7:19 PM		
8	9	10	11	12	13	14	6:45 PM Club Star Party (D)	14	
							Sunset: 7:18 PM		
15	16	17	18	19	20	21	6:45 PM Public Star Party(D)	21	
							Sunset: 7:16 PM		
22	23	24	25	26	27	28	6:45 PM Public Star Party(K) 6:45 PM Public Star Party(G)	28	
							Sunset: 7:13 PM		
29	30	31	1	2	3	4			



Venus Transit...or quail's egg?

Thanks to HAS Pres Chris Peterson, who took this image through his telescope, showing a nice grouping of sunspots on that day. (just kidding about the quail egg)



(Space Place continued from page 4)

- Studying exotic physics in extreme places like black holes.

Observing time on Hubble and the other “Great Observatories” is allocated accordingly.

Smaller missions are important, too: The Kepler spacecraft, which is only “medium-sized” by NASA standards, has single-handedly identified more than 2300 planet candidates. Recent finds include planets with double suns, massive “super-Earths” and “hot Jupiters,” and a miniature solar system. It seems to be only a matter of time before Kepler locates an Earth-sized world in the Goldilocks zone of its parent star, just right for life.

A future astrophysics mission, the James Webb Space Telescope, will be able to study the atmospheres of many of the worlds Kepler is discovering now. The telescope’s spectrometers can reveal the chemistry of distant exoplanets, offering clues to their climate, cloud cover, and possibilities for life.

That’s not the telescope’s prime mission, though. With a primary mirror almost 3 times as wide as Hubble’s, and a special sensitivity to penetrating infrared radiation, Webb is designed to look into the most distant recesses of the universe to see how the first stars and galaxies formed after the Big Bang. It is, in short, a Genesis Machine.

Says Bolden, “We’re on track in the construction of the James Webb Space Telescope, the most sophisticated science telescope ever constructed to help us reveal the mysteries of the cosmos in ways never before possible.” Liftoff is currently scheduled for 2018.

How long will the list of discoveries be in January of that year? Stay tuned for Astrophysics.

For more on NASA’s astrophysics missions, check out <http://science.nasa.gov/astrophysics/>. Kids can get some of their mind-boggling astrophysics questions answered by resident Space Place astrophysicist “Dr. Marc” at <http://spaceplace.nasa.gov/dr-marc-space>.

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

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(Star Party Report continued from page 3)

Public Star Party Report - Sat June 16, 2012

The Public Star Party was pretty much a ‘show that never was’ even though we had about 16-18 eager visitors. When we got to Dillingham, the sky was partly cloudy with menacing, dark clouds on the horizon, but we started to set up our scopes anyway.

Duke, the Security Guard was surprised we even showed up since the weather report was for cloudy, rainy, windy skies all night and into the morning. Jim MacDonald (the Key Master for the evening) decided to ‘chance it’, and we actually got to see Mercury low in the west (thanks to Walter Tokushige) and a very brief glimpse of Saturn through some of the scopes before the clouds closed in on us for good.

But that was it and we all left at 8:30pm and we adjourned to Zippy’s to commiserate, so hopefully it will be better luck next time.

Sue



Treasurer's Report

by Jim MacDonald

HAS Financial Report for the month ending as of June 15, 2012

Initial Balance:	\$4,795.98
<i>Receipts:</i>	
T-Shirt Sales	15.00
Donations	5.00
Dues Received	132.00
Magazine Payments	66.95
Total Income:	\$218.95
<i>Expenses:</i>	
Astroleague Dues	595.00
Astronews	156.67
Magazine Subscription	34.00
Postage	2.70
Total Expenses:	\$788.37
Final Balance	\$4,226.56

The club gained two new members this month. They are **Hugo Higa** and a returning member **Ken Elliott**. Our thanks to Alyce Ikeoka for her donation. Our thanks to all those who remembered to renew their membership.

Come join us for some great views of the Summer skies before Mars and Saturn depart!

.....

<<Upcoming Star Parties>>

- CLUB Party-Dillingham July 14** (G. West)
 - Public Party-Dillingham July 21** (J. MacD)
 - Kahala/Ewa Party July 28**
-

☆ ☆ Upcoming School Star Parties ☆ ☆

SUMMER!

Only one star party scheduled to date:

Friday, Sept. 21

Mililani Ike Elementary (Mililani Mauka area)



(Minutes continued from page 9)

cheers from H.A.S. members.

Star-Light Reserve Bill: *Harry Zisko* reported that SB 2402 has been passed by both houses of the State congress and now sits on Governor Abercrombie’s desk awaiting his signature. The members of the state committee appear to be behind the bill, which was not the case at the end of last years session. It is assumed that the Governor will sign the bill, but cross your fingers, anyway.

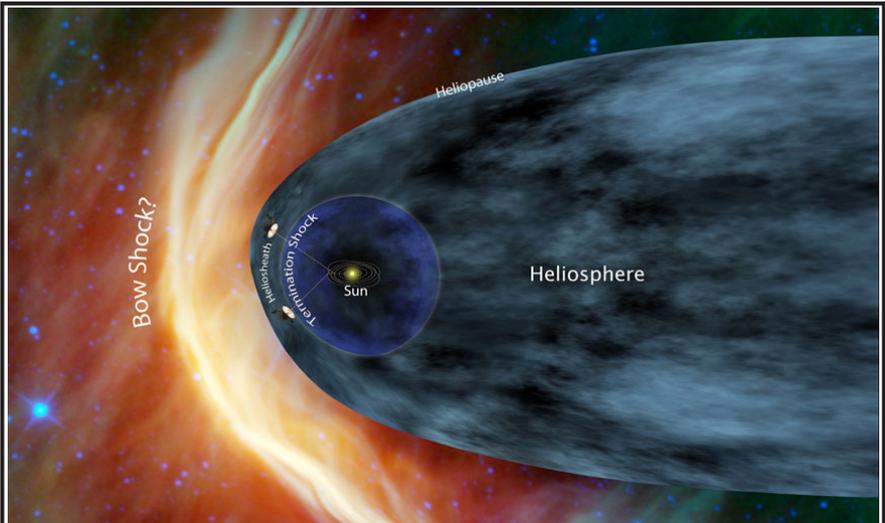
The bill will hopefully set in motion changes in the state lighting which we hope the City and County of Honolulu will also begin to follow. Changes over time, in the street and highway lighting will help reduce light pollution on O’ahu and on other islands.

Visitors: We had four visitors with us at this months meeting, new and old friends. *Harry Crosby*, found us via the internet. Also Mainlander and club member *Walter Murawski*, who helped out during the Transit of Venus, joined us at the meeting, as did the visiting former president & a current club member of H.A.S., *Stephanie Choquette*. *Nicolas Bradley*, who helped out in the blazing sun earlier in the day.

The New Planetarium: *Joanne Bogan* gave the assembled members a full scale ride, showing us the ins and outs of the new planetarium setup. The new hardware installed under the dome is the first step in a long revamping of the Planetarium. Joanne, using the new installed Digistar System took members to the planets of our Solar System and out into the Universe to visit well known constellations. Joanne’s new toy took us to the international space station, revisited the transit of Venus in a short movie, and took us on a flight through the stars. The further upgrade of the dome and the seating may displace us for a while but the results should be fantastic.

As there was no further business, the meeting was adjourned at 9:07 p.m. Refreshments were enjoyed by members after the meeting.

Respectfully Submitted,
Gretchen West
Secretary



VOYAGER 1 APPROACHES THE EDGE OF THE SOLAR SYSTEM.
(see story page 2) Image courtesy: NASA

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Deep sky images projected on the planetarium dome as part of the recent renovations.

Image courtesy: April Lew