The Astronews

HUI KILOLANI

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Asteroids! Duck and Cover!

In his own words Dr. Gareth Wynn-Williams "I'll be talking about how asteroids have been discovered and studied, about some specific historical and recent asteroid impacts, and about what we might be able to do if we find one aimed at us."

Born in London, Gareth Wynn-Williams received his BA and PhD degrees in-physics from the University of Cambridge. He held a faculty teaching position at the Cavendish Laboratory in Cambridge University for five years before taking up a professorship at the University of Hawaii in 1978, where he remained until he retired in 2012. His research focus throughout his career has been interstellar matter in the Milky Way and in other galaxies.

Inside this issue:

PotLuck!!!

Just a quick reminder, we will be having a potluck beginning at 6:00 PM before the club meeting at 7:30 PM, Also, besides the guest speaker there will be major decisions being made at this meeting. For instance, a new dues process(protocol?). Also election of officers. Be there or be square!

Upcoming Events:

The next meeting is on Tuesday December 6th at the Bishop Museum 7:30 PM.

- Bishop Museum's planetarium shows are every Saturday of the month at 8:00 PM www.bishopmuseum.org/calendar
- The next Board meeting is Sun., Oct. 30th 3:30 PM in POST building at UH.

President's Message December 2016

Sky & Telescope celebrated its 75th anniversary of publication in November. That reminded me that HAS has been around a long time as well, since 1949. I don't know much about the earliest days of our club, but I have been involved since the late 1980s, so that's more than one third of its history. There have been changes, but many things have remained the same. We are still hosted by the Bishop Museum and (usually) meet in the Planetarium.

The Museum asks, in return, that we support some of their astronomical events. Most recently, several of us brought our telescopes for the Super Moon event on November 13th. Even though most of us in the club know that there's nothing that special about the appearance of a Super Moon and that observing of or during a full Moon is something we usually try to avoid, many people came out for the event. The weather was not the best, but I was able to show people Venus, Mars, and Saturn as well as the Moon. Even views that would disappoint most of us can be exciting for someone who has never looked through a telescope before.

On nights like that, my favorite part is talking to people about the Moon and other celestial objects in between views. Most observers build up quite a knowledge base over the years, and it's pretty easy to impress non-observers with how much we know. I try to get people to think about things that normally don't cross their minds, like the vast extent of space and time represented by the sky.

The club could not continue without officers to run it. We hold elections in December, and if you are interested in serving on the board, please throw your hat

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Hawaiian Astronomical Society
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Planets Close To the Moon
Times are Hawaii Standard Time

Nov 30,19h, M 7.1° N of Mercury
(18° from sun in evening sky)
Dec 3, 01h, M 5.8° N of Venus
(44° from sun in evening sky)
Dec 4, 23h, M 2.9° NNW of Mars
(66° from sun in evening sky)
Dec 6, 12h M 0.67° NNW of Neptune
(84° from sun in evening sky)
Dec 9, 11h, M 2.7° SSE of Uranus
(122° from sun in evening sky)
Dec 22, 08h, M 2.3° NNE of Jupiter
(71° from sun in morning sky)
Dec 27, 11h, M 3.6° N of Saturn
(16° from sun in morning sky)

Other Events of Interest
Times are Hawaii Standard Time

Dec 10, 02h Saturn at conjunction with sun
(Passes into morning sky)
Dec 10, 18h, Mercury at greatest elong. from
(20.8° from sun in evening sky)
Dec 13, 14.06h, Full Moon
Dec 14, Geminid meteors
(Unfavorable year because of full moon)
Dec 21, 00:44h, Winter Solstice
(1st day of winter)
Dec 28, 09h, Mercury at inferior conj. with sun
(Passes into morning sky)
Dec 28, 20.53h, New Moon

Planets in December

Mercury ☿
is visible low in the western twilight the first two weeks of December.

Venus ♀
shines brightly in the evening sky at about 45° from the sun.

Mars ♂
Can be viewed in the southwest in the evening. It is now at about +0.7 magnitude.

Jupiter ♃
shines brightly in the eastern sky before dawn.

Saturn ♄
reaches conjunction with the sun this month, so is lost in the sun's glare.

Uranus ♅
is near the meridian as evening twilight ends, so can be viewed in the early evening hours.

Neptune ♆
west of Uranus in the evening sky.

1-Ceres (Dwarf Planet)
Can be viewed in the west in the evening sky at about magnitude +7.5

45P Honda Mrkos-Pajkušáková (Comet)
- Reaches perihelion on December 31 brighter than magnitude +10. A nice binocular object for 2+ months.

HAWAIIAN ASTRONOMICAL SOCIETY
GENERAL MEMBERSHIP MEETING
November 1, 2016

President Chris Peterson called the November 1, 2016 meeting of the Hawaiian Astronomical Society to order at 7:30 p.m. The meeting was held in Planetarium, on the grounds of the Bishop Museum, Honolulu, Hawaii. There were twenty-four members and four visitors in attendance.

Lacy Veach Day of Discovery – This year's Lacy Veach Day took place on the grounds of Punahou School on October 29, 2016. H.A.S. again participated in the workshop that promotes the sciences for elementary, intermediate and high school students, their parents and teachers. H.A.S. members April Lew, Ort Sapavith, Peter Besenbruck, Gretchen West, and our youngest member, Jarin contributed, working the full five hours. Although the skies were cloudy, some solar viewing was possible and the four scopes that were on site that day allowed our members to give kids a good idea of what our organization is all about.

Hawaii Space Lecture Series – Dr Kimberly Binsted of the University of Hawaii Manoa is scheduled to speak this month at the Hawaii Space Lecture Series. The subject of her talk will be HI-SEAS: Going to the Red Planet Via the Big Island. This month's lecture will take place Tuesday, November 22nd, 2016 at 7:30 pm. The lecture will be located at the NASA Pacific Regional Planetary Data Center, room 544 in the Pacific Ocean Science and Technology Building on the Manoa campus of the University of Hawaii. Should you be interested in upcoming lectures or for information you can contact NASA PRPDC at 808-956-3132 or on the Web go to http://www.higp.hawaii.edu/prpdc.

Pot Luck Supper - We will be having a Pot Luck Supper prior(6:00 PM) to the December 2016 General Membership meeting. Pencil it in on your calendars and consider what you will bring to help us celebrate the holiday season. The supper will be held in the Activity room adjacent to the Bishop Museum Planetarium.

Super Moon - This month will see a "Super Moon" on the evening of November 16th. H.A.S. will be helping out at the Bishop Museum. Astronomers will be setting up on the great lawn to allow visitors to see the blinding sight.

Star Party Report – Star Party Coordinator Mark Watanabe spoke briefly about upcoming school star parties.

Other upcoming school events are:

Nov. 7 – Punahou School
Trinity Christian School has requested a star party but no date is

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December 2016

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
27	28	29	30	1 6:00 PM Classical Conversations S	2	3 5:30 PM Public Star Party(G) 5:30 PM Public Star Party(K)
4 sunset 17:49	5	6 7:30 PM Club Meeting	7	8	9 6:30 PM Ka Waihona Public Charter	10
11 sunset 17:51	12	13	14	15	16	17 5:40 PM Club Star Party(D)(Private)
18 sunset 17:54	19	20 8:00 PM Globe at Night	21 8:00 PM Globe at Night	22 8:00 PM Globe at Night	23 8:00 PM Globe at Night	24 8:00 PM Globe at Night
25 8:00 PM Globe at Night sunset 17:57	26 8:00 PM Globe at Night	27 8:00 PM Globe at Night	28 8:00 PM Globe at Night	29 8:00 PM Globe at Night	30 8:00 PM Globe at Night	31

☐☐Upcoming Star Parties☐☐

Public Party Geiger December 3
Public Party Kahala December 3

Upcoming School Star Parties

Fri	December 9	Ka Waihona Public Charter

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scheduled as of now.

Nov. 17 - Montessori Community School will have a suburban star party at their school at 1239 Nehoa St.

Dec. 1 – Classical Conversations Homeschoolers will have a star party in Kapolei.

The schedule of meetings as well as dark sky and suburban star parties has been posted on the club website. .

Tom Giguere spoke briefly about how to better engage our spectators when we view the Moon. He handed out packs of NASA cards and pictures of the Moon.

International Observe the Moon Night - October 8, 2016 was the date of our scheduled suburban star party at Kahala Community Park in East Honolulu and Geiger Park out in Ewa Beach. It was also the date of the International Observe the Moon Night. Although it was quite cloudy some individuals joined us to become a "lunatic" and observe the moon in all its shrouded glory.

H.A.S. Elections coming in December – The yearly H.A.S. Board of Directors meeting will take place during the December General Membership meeting. Those who want to run for office should submit their names to the elections officer during the November meeting. We are currently looking for an elections officer.

Visitors – This month three visitors joined us to enjoy the evening. Keona Blanks, Emily Maldonado and Steve Kasmer decided to join us at the Planetarium for the evening. They found us after looking on our website and joining us at our star parties.

New Ideas for Star Parties – In an effort to get more people to come to our star parties, Chris Peterson has initiated discussions on H.A.S. conducting special equipment demonstrations at star parties. Such demonstrations will help members become more familiar with eyepieces and other equipment. We will have further discussions at future meetings.

H.A.S. Yearly Elections – Those who attend the December membership meeting will be voting to elect the next H.A.S. Board. All current Board members have indicated that they will be standing for reelection, except Calvin Olivera who is on extended deployment. He indicated that he would be willing to step back on to the Board when he returns should he be asked. Mark Watanabe will be standing for election as Star Party Coordinator. As in years past, Joanne Bogan will be our Elections Coordinator, so if you are interested in standing for a position on the H.A.S. Board of Directors please speak to Joanne. Come one. Come all!

Peter's Show & Tell – Vice-President Peter Besenbruch presented a Power Point presentation on the following:

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Boasting intricate patterns and translucent colors, planetary nebulae are among the most beautiful sights in the universe. How they got their shapes is complicated, but astronomers think they've solved part of the mystery—with giant blobs of plasma shooting through space at half a million miles per hour.

Planetary nebulae are shells of gas and dust blown off from a dying, giant star. Most nebulae aren't spherical, but can have multiple lobes extending from opposite sides—possibly generated by powerful jets erupting from the star.

Using the Hubble Space Telescope, astronomers discovered blobs of plasma that could form some of these lobes. "We're quite excited about this," says Raghvendra Sahai, an astronomer at NASA's Jet Propulsion Laboratory. "Nobody has really been able to come up with a good argument for why we have multipolar nebulae."

Sahai and his team discovered blobs launching from a red giant star 1,200 light years away, called V Hydrae. The plasma is 17,000 degrees Fahrenheit and spans 40 astronomical units—roughly the distance between the sun and Pluto. The blobs don't erupt continuously, but once every 8.5 years.

The launching pad of these blobs, the researchers propose, is a smaller, unseen star orbiting V Hydrae. The highly elliptical orbit brings the companion star through the outer layers of the red giant at closest approach. The companion's gravity pulls plasma from the red giant. The material settles into a disk as it spirals into the companion star, whose magnetic field channels the plasma out from its poles, hurling it into space. This happens once per orbit—every 8.5 years—at closest approach.

When the red giant exhausts its fuel, it will shrink and get very hot, producing ultraviolet radiation that will excite the shell of gas blown off from it in the past. This shell, with cavities carved in it by the cannon-balls that continue to be launched every 8.5 years, will thus become visible as a beautiful bipolar or multipolar planetary nebula.

The astronomers also discovered that the companion's disk appears to wobble, flinging the cannonballs in one direction during one orbit, and a slightly different one in the next. As a result, every other orbit, the flying blobs block starlight from the red giant, which explains why V Hydrae dims every 17 years. For decades, amateur astronomers have been monitoring this variability, making V Hydrae one of the most well-studied stars.

Because the star fires plasma in the same few directions repeatedly, the blobs would create multiple lobes in the nebula—and a pretty sight for future astronomers.

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Meteor Log—November 2016

by Tom Giguere

.The Geminids are usually the strongest meteor shower of the year and meteor enthusiasts usually circle December 13 and 14 on their calendars. This is the one major shower that provides good activity prior to midnight as the constellation of Gemini is well placed from 10pm onward. The Geminids, parent object 3200 Phaethon (asteroid), are often bright and intensely colored. Due to their medium-slow velocity, persistent trains are not usually seen. These meteors are also seen in the southern hemisphere, but only dur-

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First Quarter	**Full Moon**	**Last Quarter**	**New Moon**
December 7	December 14	December 21	December 29

Shower	**Activity**	**Maximum**		**Radiant**		V_∞	*r*	**ZHR**
		Date	$\lambda_\odot$	**α**	**δ**	**km/s**		
Phoenicids (PHO)	11/28→12/09	Dec 06	254.25°	18°	-53°	18	2.8	Var
Puppid/Velids (PUP)	12/01→12/15	(Dec 07)	(255°)	123°	-45°	40	2.9	10
Monocerotids (MON)	11/27→12/17	Dec 09	257°	100°	+08°	42	3.0	2
σ-Hydrids (HYD)	12/03→12/15	Dec 12	260°	127°	+02°	58	3.0	3
Geminids (GEM)	12/04→12/17	Dec 14	262.2°	112°	+33°	35	2.6	120
Comae Berenicids (COM)	12/12→12/23	Dec 16	264°	175°	+18°	65	3.0	3
Dec. Leonis Minorids (DLM)	12/05→02/04	Dec 19	268°	161°	+30°	64	3.0	5
Ursids (URS)	12/17→12/26	Dec 22	270.7°	217°	+76°	33	3.0	10

The Moon is not a friend of the Geminids this year, but you may still see some! For more info: Thomas Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.

Treasurer's Report

by April Lew

HAS Financial Report October 16 –November 15 2016			
Beginning Balance			785.48
Income:			
	Dues Received	90.00	
	T-shirt sales	15.00	
	Calendar sales	58.50	
Total Income			168.50
Expenses:			
	Nov. Astronews printing & mailing	110.70	
	Calendar order	106.00	
	Stamps	15.04	
Total Expenses			231.74
Ending Balance			722.24

Many thanks to those renewing their membership (Kimberly & Hieu Nguyen & Gina Ho, Colleen Soares , Eliot Willauer, Jr.)

We welcome three new members this month. They are **John Bradley, Hope Ishii and Emily Maldonado**.

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As a reminder, please check your membership anniversary date listed on the Astronews address label. Clear skies to all!

(Continued from page 2) President's Message

in the ring at the meeting. Even if you don't run this time, please consider helping out at some point in the future. There is a great deal of satisfaction to be derived from helping a venerable institution like the Hawaiian Astronomical Society to continue its traditions of learning about the night sky and sharing that knowledge with others.

At any rate, please come to the December meeting. We'll have a potluck beforehand, elections, and a speaker. It's a good way to finish the year.

Chris Peterson

(Continued from page 6) Meeting Minutes

The European Space Agency's ExoMars orbiter is sending back images of Mars, although the Schiaparelli Mars lander crashed last month.

The Juno spacecraft, which successfully entered the orbit of Jupiter on July 4, 2016, made a second close pass and shifted into safe mode.

Falcon 9 explosion

Rosetta craft crash

Cosmos news about asteroids

NGC 2440- digital survey

ALMA sub-millimeter array in S. America

Dark Energy discussion

Mercury- is it still alive?

Saturn's polar hexagon

Titans polar vortex

Planet X returns – Is the Kuiper Belt object effecting other objects in the solar system? What might it's effect be on our sun?

The ISS crew returning to Kazakhstan – U.S., Soviet and Japanese astronauts return to Earth via Russian Soyuz craft.

Planetarium Ride – Joanne took us on another ride through the cosmos and we viewed the laser show.

Mahalo – As there was no further business, the meeting was adjourned at 9:00 p.m. Post meeting goodies were available in the rotunda.

Respectfully Submitted

Gretchen West

H.A.S. Secretary

(Continued from page 8) Meteor Log Tom Giguere

ing the middle of the night and at a reduced rate. Unfortunately, this year the Moon is a major hindrance for viewing since the peak occurs on the night of the full moon. An alternative to viewing on the peak evening would be to go out a few days prior to the peak in the pre-dawn hours just before sunrise. This would afford a couple of hours of dark sky viewing.

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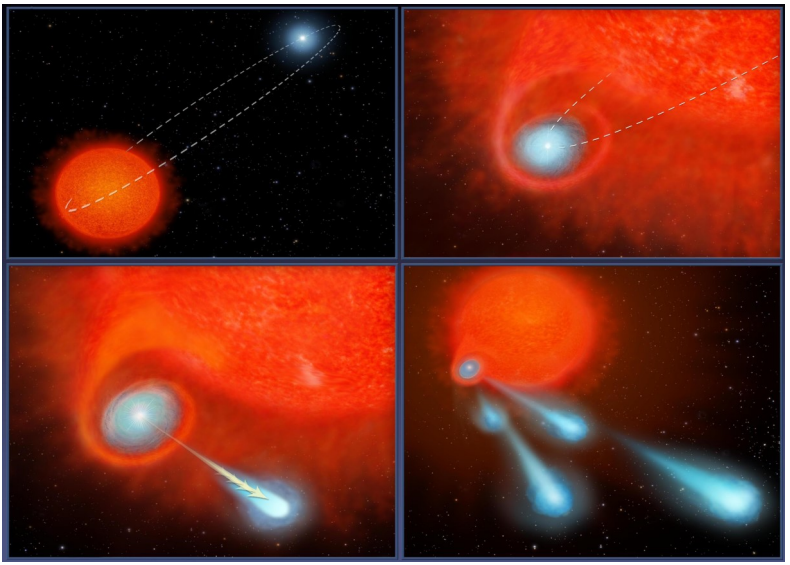
The Ursids are often neglected due to the fact the shower peaks just before Christmas and the rates are much less than the Geminids. The Geminids peak just a week before the Ursids. Observers will normally see 5-10 Ursids per hour during the late morning hours on the date of maximum activity which are active from December 17th to the 23rd. There have been occasional outbursts when rates have exceeded 25 per hour. These outbursts appear unrelated to the perihelion dates of comet 8P/Tuttle. This shower is strictly a northern hemisphere event as the radiant fails to clear the horizon or does so simultaneously with the start of morning twilight as seen from the southern tropics. The Moon is a day past last quarter, which allows early/late evening observing before the moon rises.

(Continued from page 7) Space Place

If you'd like to teach kids about how our sun compares to other stars, please visit the NASA Space Place: http://spaceplace.nasa.gov/sun-compare/en/



This four-panel graphic illustrates how the binary-star system V Hydrae is launching balls of plasma into space. Image credit: NASA/ESA/STScI

A 2009 Geminid over Monument Valley, AZ. Credit: 623 life

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The Flaming Star Nebula from CFHT

Credit & Copyright: Jean-Charles Cuillandre (CFHT) & Giovanni Anselmi (Coelum Astronomia), Hawaiian Starlight