The Astronews

HUI KILOLANI

Volume 66, Issue 9

September 2016

www.hawastsoc.org

Proxima b : Is anyone out there?

We all know that the Milky Galaxy is 100,000 light years across and that our nearest neighbor star(s)(4.24 ly) is the Centauri group of three stars (Alpha Centauri A & B and Proxima Centauri). The search for exo-planets has turned up a (possible) planet orbiting around Proxima Centauri and with the startlingly original name Proxima Centauri b. What makes this such an awesome discovery is that it is about the size of Earth and is in the "Goldilocks Zone" or the more standard phrase "Habitable Zone". This is grounds for divorce from cold hard reality with a spinoff into wild eyed imaginative musings. Most all of us who have a taste for such things won't need any help from yours truly to get off the ground on this one. There is one thing that I believe most people would like to know before we check out from Spaceship Earth is whether there is sentient life elsewhere. (hope, hope, hope etc). For those who like ice on their news, please see a very informative article on SciAm (http://blogs.scientificamerican.com/guest-blog/yes-we-ve-discovered-a-planet-orbiting-the-nearest-star-but/). I tracked down the author for her homepage (http://astro3.sci.hokudai.ac.jp/~tasker/) so you can feel relieved that the author has creds on the subject.

Inside this issue:

Upcoming Events:

The next meeting is on Tuesday September 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., Sep. 4th 3:30 PM in POST building at UH.

President's Message
September 2016

One spacecraft of interest to astronomers ends it mission this month and another is launched. The European Space Agency's Rosetta mission arrived at Comet 67/P Churyumov-Gerasimenko (or CG for short) in August of 2014. Its lander, Philae, was deployed in November of that year. While Philae landed on the comet and transmitted a substantial amount of information, the systems that were supposed to secure it to the surface all failed, and it bounced to an unknown location that didn't provide enough sunlight to recharge its batteries so that it could continue working when the initial charge was depleted. Nevertheless, the mission was largely successful and returned the most detailed information on a comet to date.

Now the mission is nearing its end. As the comet and spacecraft recede toward the orbital distance of Jupiter, solar energy for science and communications is dwindling. In a grand finale, the spacecraft will make ever-closer approaches to CG before being landed on the surface on September 30th. No communication is expected post landing.

Meanwhile, NASA's OSIRIS-Rex mission (Origins, Spectral Interpretation, Resource Identification, Security, Regolith explorer) is preparing for launch as early as September 8th with a two-hour launch window each day for 34 days. It should arrive in orbit at Asteroid Bennu in October of 2018. After studying and mapping Bennu, it will attempt to acquire a sample of the surface material in a touch-and-go maneuver in July of 2020. Up to three attempts will be made to collect between 60 grams and 2 kilograms of material. The space-

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Hawaiian Astronomical Society
P.O. Box 17671
Honolulu, Hawaii 96817

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Planets Close To the Moon
Times are Hawaii Standard Time

Sep 2, 11h, M 5.7° NNE of Mercury
(17° from sun in evening sky)
Sep 2, 12h, M 0.36° NNE of Jupiter
(18° from sun in evening sky)
Sep 3,01h, M 1.1° NNE of Venus
(24° from sun in the evening sky)
Sep 8, 12, M 3.8° N of Saturn
84° from sun in evening sky)
Sep 9, 05h, M 7.9° N of Mars
(92° from sun in morning sky)
Sep 15, 10, M 1.1° NNW of Neptune
(167° from sun in evening sky)
Sep 18, 08h, M 2.8° SSE of Uranus
(153° from sun in morning sky)
Sep 29, 00h, M 0.67° SSW of Mercury
(18° from sun in morning sky)

Other Events of Interest
Times are Hawaii Standard Time

Aug 31, 23:03h, New Moon
Sep 2, 07h, Neptune at opposition
Sep 8, 14h, 1 Ceres 0.64° SSW of
18 Melpomene
(30° from the sun in morning sky)
Sep 12, 14h, Mercury at inferior conj. with sun
(Passes into morning sky)
Sep 16, 09:05h, Full Moon
Sep 22, 04:21h Autumn equinox
(End of summer, beginning of fall)
Sep 25, 21h, Jupiter at conj. with sun
(Passes into morning sky)
Sep 28, 09h, Mercury at greatest elongation
(17.9° West of the sun in morning sky)

Planets in September

Mercury
makes one of its best appearances of the year in the predawn sky at the end of the month. (Sep. 28-30)

Venus
is low in the western sky after sunset

Mars
Can be viewed in the south-west in the evening. It is still at negative magnitude (-0.1) but is dimming rapid-ly.

Jupiter
near mercury the first week of the month low in the west, reaches conjunction with the sun on Sep. 25.

Saturn
Shines brightly close to Mars in the mid-evening hours.

Uranus
is in the eastern sky at sunset and can be seen in the east before dawn. Will be easier to observe later in the year.

Neptune
is in the eastern sky at sunset and can be ob-served most of the night.

1-Ceres (Dwarf Planet)
very close to asteroid 18 Melpomene on Sep 8 at mag 8.2.

Pluto (Dwarf Planet)
still fairly well placed for viewing in the evening hours.

HAWAIIAN ASTRONOMICAL SOCIETY
GENERAL MEMBERSHIP MEETING
August 2, 2016

President Chris Peterson called the August 2, 2016 meeting of the Hawaiian Astronomical Society to order at 7:33 p.m. The meeting was held in Planetarium, on the grounds of the Bishop Museum, Honolulu, Hawaii. There were twenty-one members and three visitors in attendance.

Observing: President Chris Peterson announced that there will be viewing of the nights sky on the observing deck after this evening's meeting, should the weather permit. The night sky is peppered with planets. Venus and Mercury are riding the Sun's coat tails at sunset. They join Jupiter in the West and Mars and Saturn playing hide-and-seek on either side of Scorpion. It is the best of the cycle since 2003.

Chris made a request to interested members to join us at either the dark sky viewing site at Dillingham Airfield on the North Shore of O`ahu, or at our suburban star parties at Geiger Park in Ewa, or at Kahala Community Park in East O`ahu.

Hawaii Space Lecture Series – This month the Hawaii Space Lecture Series will not present a free lecture. Regular lectures usually take place 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

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(Continued from page 2) *President's Report*

craft will then leave Bennu as early as March 2021 for a return of the samples to Earth in September of 2023.

Bennu is a primitive carbonaceous asteroid with a diameter of only about 500 meters. Meteorites derived from this kind of asteroid are rather uncommon. They are full of organic compounds, possibly the precursor materials that allowed life to develop on Earth, and they are rather fragile at Earth's surface. The material returned from Bennu should be relatively unchanged since the time of the formation of the solar system 4.5 billion years ago.

In other news, an Earth-sized planet has been discovered in the habitable zone of our nearest stellar neighbor, Proxima Centauri. Since Proxima is a red dwarf, its habitable zone is very close. The planet orbits in only 11 days and is probably tidally locked to Proxima, showing only one side to the star.

Chris Peterson

September 2016

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
28	29	30	31	1 8:00 PM Globe at Night	2 8:00 PM Globe at Night	3 6:30 PM Public Star Party(D)
4 sunset 18:44	5	6 7:30 PM Club Meeting	7	8	9 Hawaii Baptist Academy 7:00 PM	10 6:20 PM Public Star Party(G) 6:20 PM Public Star Party(K)
11 sunset 18:38	12	13	14	15	16	17
18 sunset 18:31	19	20	21	22	23	24 6:05 PM Club Star Party(D) (Private)
25 sunset 18:24	26	27	28	29	30	1

☐☐Upcoming Star Parties☐☐

Public Party-Dillingham September 3
Public Party Geiger September 10
Public Party Kahala September 10

Upcoming School Star Parties

Fri	September 9	Hawaii Baptist Academy

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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.

Upcoming Events: Saturday, October 29, 2016 at Punahou School will be the location of this year's annual Lacy Veach Day of Discovery. We have had members sign up to help during the event.

President Chris Peterson related that a high school student is looking for ideas for his community service project. It was suggested that he might use the club light meter, on loan from the I.F.A., to monitor light pollution in different locations in his area, at different times of the evening.

The Astronomical League of the Pacific, of which H.A.S. is a member, has been paid our $750 in yearly dues. Chris informed our members that should they wish, they could attend the Astronomical League's yearly convention in Washington D.C. on August 8 through 13, 2016. Chris also reminded interested members of the upcoming total solar eclipse that make its way across the U.S. later in 2017. Casper Wyoming will be celebrating the eclipse.

Visitors - Janelle Trusty-Dante, now serving in the Navy, joined us this evening. She is interested in reacquainting herself with the night sky.

Star Party Report – Our intrepid Star Party Coordinator will be handing over the full responsibilities to his co-coordinator Mark Watanabe for the time being, as he will be off island for a while. Calvin also reports that we will be helping out at the H.B.A. school star party on September 2nd or 9th, whichever the school ultimately chooses. It's hard because they are fighting a full moon.

Perseid Meteor Showers – Members should be aware that the Perseid meteor showers should be exceptionally good this year. The Moon will make a fortuitous departure just prior to the meteor shower. Best times should be between 3:00 a.m. and 5:00 a.m., the morning of August 12. Some members will be trying to coordinate viewing out in Waianae, with the help of Charlie Rykken.

Pot Luck Supper - We will be having a Pot Luck Supper prior 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 Planetarium.

Swap Meet – President Chris Peterson continued a discussion as to whether we will hold a swap meet prior to an upcoming general membership meeting.

NASA News - The non-compressed data from the New Horizons

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When the advent of large telescopes brought us the discoveries of Uranus and then Neptune, they also brought the great hope of a Solar System even richer in terms of large, massive worlds. While the asteroid belt and the Kuiper belt were each found to possess a large number of substantial icy-and-rocky worlds, none of them approached even Earth in size or mass, much less the true giant worlds. Meanwhile, all-sky infrared surveys, sensitive to red dwarfs, brown dwarfs and Jupiter-mass gas giants, were unable to detect anything new that was closer than Proxima Centauri. At the same time, Kepler taught us that super-Earths, planets between Earth and Neptune in size, were the galaxy's most common, despite our Solar System having none.

The discovery of Sedna in 2003 turned out to be even more groundbreaking than astronomers realized. Although many Trans-Neptunian Objects (TNOs) were discovered beginning in the 1990s, Sedna had properties all the others didn't. With an extremely eccentric orbit and an aphelion taking it farther from the Sun than any other world known at the time, it represented our first glimpse of the hypothetical Oort cloud: a spherical distribution of bodies ranging from hundreds to tens of thousands of A.U. from the Sun. Since the discovery of Sedna, five other long-period, very eccentric TNOs were found prior to 2016 as well. While you'd expect their orbital parameters to be randomly distributed if they occurred by chance, their orbital orientations with respect to the Sun are clustered extremely narrowly: with less than a 1-in-10,000 chance of such an effect appearing randomly.

Whenever we see a new phenomenon with a surprisingly non-random appearance, our scientific intuition calls out for a physical explanation. Astronomers Konstantin Batygin and Mike Brown provided a compelling possibility earlier this year: perhaps a massive perturbing body very distant from the Sun provided the gravitational "kick" to hurl these objects towards the Sun. A single addition to the Solar System would explain the orbits of all of these long-period TNOs, a planet about 10 times the mass of Earth approximately 200 A.U. from the Sun, referred to as **Planet Nine**. More Sedna-like TNOs with similarly aligned orbits are predicted, and since January of 2016, another was found, with its orbit aligning perfectly with these predictions.

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Meteor Log—August 2016

by Tom Giguere

The August Perseids are behind us now, but certainly not forgotten. Our group was spread far and wide for viewing this year, which makes for a good sampling of this yearly favorite. With the eastern group observing from Wyoming and the western contingent observing from the west coast of Oahu, we were spread too far apart to attempt any meteor triangulation (to determine heights). Recall from last month's Meteor Log, there was a prediction of a higher maximum by researchers (Maslov and Lyytinens) who calculated that the Earth will cross a part of the debris stream left by parent comet, 109P/Swift-Tuttle. Based on our two data points, it doesn't appear that we observed increased activity.

The east group observed from a spot just a few miles north of Jackson, Wyoming on Friday morning, August 12th. There were just two in our party. Friend Vic Wagner, past president of the Orange County Astronomers, now in Jackson, hosted the observing session. Skies were crystal clear, temperature in the 40's, and a dark sky limiting magnitude of 6.5. We observed 32 Perseids, and 3 sporadics, in about one hour. I set up a 20mm wide-angle lens on autopilot and captured 3 meteors over the hour.

The west group, composed of Ort and Susan Vanapruks, and Charlie Rykken

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First Quarter	**Full Moon**	**Last Quarter**	**New Moon**
September 9	September 16	September 23	September 1

Shower	**Activity**	**Maximum**		**Radiant**		V_∞	*r*	**ZHR**
		Date	$\lambda_\odot$	**α**	**δ**	**km/s**		
α-Aurigids (206 AUR)	08/28→09/05	Aug 31	158.6°	91°	+39°	66	2.5	6
Sept. ε-Perseids (208 SPE)	09/05→09/21	Sep 09	166.7°	48°	+40°	64	3.0	5

If you witnessed any Perseids, please let us know! For more info contact: Tom 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 July 16 – August 15 2016			
Beginning Balance			1,854.43
Income:			
	Dues Received	66.00	
	Donation	15.00	
Total Income			81.00
Expenses:			
	June Astronews printing & mailing	157.26	
	Astronomical League dues	760.00	
Total Expenses			917.26
Ending Balance			1,018.17

We welcome a new member this month. He is **Daniel Mallway**.

Many thanks to those renewing their membership (Martin Kinna, Mark, Cheryl, Lura, and David Looper)

.

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

2017 CALENDARS Available!!!!

The "Deep Space Mysteries" calendar presented by Astronomy Magazine, extra large size: 13" by 23' opened, is filled with stunning images of stars, planets, galaxies, and other deep space wonders, with highly informative essays accompanying each photograph. They are available at a discount through our club for only $6.50!

Treasurer April Lew will be accepting orders for the 2016 calendars: $6.50 each, cash or check, at the September & October HAS meeting, or mail your order by Oct 10 with check made out to "Hawaiian Astronomical Society" To: Hawaiian Astronomical Society, P.O. Box 17671, Honolulu, HI 96817.

(Continued from page 11) *Meteor Log Tom Giguere*

fraction of an hour. The main peak, which occurred over the America's, was estimated to reach a zenith hourly rate near 120 with many bright meteors. Unlike the short bursts seen over Europe, the main peak lasted many hours centered near 10 Universal Time (3:00am PDT) on August 12. Our east group observed at ~4am (3am PDT) which is right at the peak, and our west group observed 11pm to 2am HST (2am to 5am), which bracketed the peak time. Observers from Florida to California were seeing hourly rates approaching 100 per hour as viewed from dark sky sites. Rates on Saturday morning were still impressive although not as strong as those seen on Friday morning. Bright meteors were continuing to appear even though rates were falling.

(Continued from page 6) Meeting Minutes
mission is slowly being downloaded, a long process that should reap interesting benefits. The Juno mission has planned to make 37 orbits of Jupiter to map the planet's gravity field and, hopefully, the inner structure of this gas giant. On Mars, Curiosity is now in its 12 year of its three-month mission. This will be the last gasp for the rover.

Discussions - President Chris Peterson reported upon the following:

Eruptions on the Moon – Rima Prinz and Schroter's Valley
Sticky Moon Dust and its uses.

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

a. Venus's clouds and ultra-violet light
b. Better than Tatooine – HD131399AB
c. The 500-year day orbit of a sun larger than our own.
d. A July Sale for Televue eyepieces.
e. Radio telescopes
f. The Alma Array on the Atacama Desert.
g. Some 1962 John Glenn memorabilia has recently sold for a large amount.
h. A 36" Newtonian telescope for sale in Arizona.
i. Calculating the distribution of materials on extra-solar planets.
j. A new Chinese eyepiece
k. A study of asteroids
l. 1960 Russian moon mission.

Mahalo – As there was no further business, the meeting was adjourned at 9:04 p.m. Members adjourned to look at the night skies on the observing deck. Post meeting goodies were available in the rotunda.

Respectfully Submitted

Gretchen West

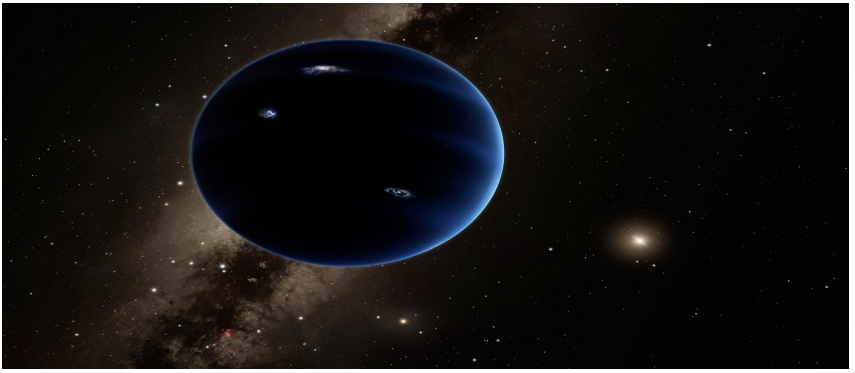
H.A.S. Secretary

(Continued from page 8) Meteor Log Tom Giguere
set up camp at the Mouna Farm on the Waianae coast. The group observed starting Thursday through Friday morning, August 12th. They had to wait for the clouds to clear, so roughly begin observing at 11pm and saw their last meteor at 2am. Despite the cloud battle, they did tally 23 Perseids, and 2 sporadics, in about three hours.

This just in … just received additional reports via Ort:
* Ort's daughter and friend saw 23 Perseids on August 12, from 2:30-3:30am HST, Kapolei.
* Sue Girard, Gretchen, and April saw 30 Perseids and 5 sporadics, from 11pm to 2:30am HST, Kahala.

(Continued from page 7) Space Place

Ten meter class telescopes like Keck and Subaru, plus NASA's NEOWISE mission, are currently searching for this hypothetical, massive world. If it exists, it invites the question of its origin: did it form along with our Solar System, or was it captured from another star's vicinity much more recently? Regardless, if Batygin and Brown are right and this object is real, our Solar System may contain a super-Earth after all.



A possible super-Earth/mini-Neptune world hundreds of times more distant than Earth is from the Sun. Image credit: R. Hurt / Caltech (IPAC)

A lone Perseid with the Hyades and Pleiades, 4:28am MDT, Aug 13, 2016. Jackson, Wyoming

(Continued from page 10) Meteor Log Tom Giguere (see photo above ↑ ↑ ↑ ↑ ↑ ↑)

Thanks for your reports!

Although we may have missed the "200 meteors per hour peak", both groups enjoyed a nice show. According the American Meteor Society, there were observers in the eastern hemisphere that successfully observed two outbursts that occurred at 22:40 and 23:24 universal time. They estimated rates for these short bursts of Perseid activity at approaching 200 per hour but the peaks only lasted a

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H.A.S.
P.O. Box 17671
Honolulu, HI 96817

Jupiter's north polar region is coming into view as NASA's Juno spacecraft approaches the giant planet. This view of Jupiter was taken on August 27, when Juno was 437,000 miles (703,000 kilometers) away. The Juno mission successfully executed its first of 36 orbital flybys of Jupiter.