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Upcoming Events:

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

Soft Aware
by Charlie Rykken

As a certified computer geek, my views on this subject are highly biased, so caveat emptor on what follows. Born in 1948 I have seen the development of electronics from tubes to transistors to integrated circuits. As a professional programmer beginning in 1971 I have also witnessed the marriage of electronics (hardware) and software. We are now at a stage where simulation software in computer games has made believable the idea that we are living in a software simulation like in The Matrix movies and ideas of a computable universe https://www.youtube.com/watch?v=VqULEE7eY8M The Simulation Hypothesis. I have mentioned the software from the Hayden Planetarium, The Digital Universe before but there is something new out that is based on all the excitement of exo-planets. If you want to explore strange new worlds, to seek out new life and new civilizations, to boldly go where no one has gone before check out https://eyes.nasa.gov/eyes-on-exoplanets.html. My friend Richard Dickison pointed the above site out to me as well as this site http://www.thehumanitystar.com/ which reminds me of the main reason for my interest in astronomy. Isn’t our universe wonder full? Software is a lot of fun but I prefer the real thing the most even if it is a simulation.
President’s Message
February 2018

Did you see the “Super Blue Blood Moon”? As I write this, it hasn’t happened yet, so I can’t tell you if I did (will). What was wrong with “total lunar eclipse”? It seems that there is sensation inflation going on these days – new and more exciting descriptions must be continually invented to describe something that hasn’t changed. At any rate, the enjoyment of the phenomenon will remain the same.

We had a question on our Facebook page about figuring out where the Moon would be in the sky at the time of the eclipse. The writer downloaded some software, but was still having trouble getting his answer, so I sent this message:

Let’s think this through using some basic info. A lunar eclipse can occur only at full Moon (when the Moon is opposite the Sun in our sky). That means the Moon rises at about sunset and sets at about sunrise, and it is highest overhead about midnight. That means that this eclipsed Moon will be visible on its way down toward where it will set (about as far north of west as the Sun rises south of east this day). At mid-eclipse it should be about halfway between the zenith and the horizon towards the west. It should be visible almost anywhere on Oahu if the skies are clear. Happy hunting!

Astronomical software is great, but we don’t always need it to figure out an answer to a question. Most of you probably knew everything I described, but you might not have realized that you could have figured that out using what you already knew. Sometimes it’s good to look inside oneself first before relying on an outside tool.

(Continued on page 10)
Observer’s Notebook—February 2018  by Jay Wrathall

Planets in February

<table>
<thead>
<tr>
<th>Planet</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>is too close to the sun to be viewed in February.</td>
</tr>
<tr>
<td>Venus</td>
<td>is also too close to the sun to view in February, having reached superion conjunction on January 8.</td>
</tr>
<tr>
<td>Mars</td>
<td>is in scorpius in the early morning sky, as it moves toward opposition in July.</td>
</tr>
<tr>
<td>Jupiter</td>
<td>is visible in the pre-dawn sky below Mars.</td>
</tr>
<tr>
<td>Saturn</td>
<td>is low in the eastern sky before sunrise late February.</td>
</tr>
<tr>
<td>Uranus</td>
<td>can be viewed in the east after sunset.</td>
</tr>
<tr>
<td>Neptune</td>
<td>is too close to the sun to be viewed in February.</td>
</tr>
<tr>
<td>1 Ceres (Dwarf Planet)</td>
<td>Reached opposition on Jan 31 at magnitude +6.8 so this is the best month of the year to view this dwarf planet.</td>
</tr>
<tr>
<td>Pluto (Dwarf Planet)</td>
<td>reached conjunction with the sun last month so is still too close to the sun to be viewed.</td>
</tr>
</tbody>
</table>
President Chris Peterson called the January 2, 2018 meeting of the Hawaiian Astronomical Society to order at 7:30 p.m. The meeting was held in the Planetarium on the grounds of the Bishop Museum, Honolulu, Hawaii. There were seventeen members in attendance.

Meeting minutes: Chris said the meeting minutes of the previous meeting need to be approved at the beginning of the next meeting. He read the Dec. 5 meeting minutes. Two errors or omissions were noted: Ort Vanapruks: the Geiger Park permission; and a lunar eclipse will take place Jan. 30 – 31. Chris called for approval of meeting minutes. Assembly approved all parts of the meeting minutes.

Ort Vanapruks said he was waiting for a call back regarding the Geiger Park permit.

Barry Peckham said the Kahala Park permit was pending.

Mark Watanabe said there are no star school Parties to announce for January.

Joanne Bogan announced that the Bishop Museum would not be having a public viewing event for the upcoming lunar eclipse.

Joanne asked for a volunteer to operate the telescope for the Feb. 3 Bishop Observatory public star viewing.

Tom Giguerre and Ort gave a report on the Geminid meteor shower viewed from a cane field past Wahiawa. A total count of 438 meteors was reported.

Six students from Campbell High School were in attendance at the Geiger Park star party. Campbell High School and Kamehameha School both have started Astronomy clubs.

Sue Girard posted on Ort’s Facebook page that she, Gretchen West and April Lew went to Hunakai Park to view the Geminid meteor shower from 9:30 pm to 11 pm and counted 27 meteors.

Chris reported that the Kahala Star Party was a decent night. It was ended at 8 pm.

(Continued on page 6)
Hawaiian Astronomical Society
Event Calendar

--Upcoming Star Parties--
Public Party-Dillingham February 17 (Andy Stroble)
Public Party Geiger February 24
Public Party Kahala February 24

Upcoming School Star Parties
Fri February 23 Hokulani Star Party

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Ort showed his pictures of the Geminid meteor showers. He used 2 cameras; the first set to take an exposure of 20 seconds every 25 seconds, and the second camera to take a 30 second exposure every 35 seconds for a total of about 600 pictures.

Treasurer Peter Besenbruch presented some current astronomical news including:

A massive black hole with a mass of 800,000,000 suns has been found in the center of an ultra bright quasar, the light of which was emitted just 690 million years after the Big Bang. The quasar has a redshift of 7.54. Its light has taken about 13 billion years to reach us—a span of time that is nearly equal to the age of the universe.

Observation of interstellar object ‘Oumuamua shows no evidence of artificial signals.

A clip from “All in with Chris Hayes” about a Pentagon UFO program with video footage from the cockpit of a Navy FA-18 fighter jet following an ‘ufo’.

The Skull asteroid - An asteroid that looks like a skull from certain angles flew harmlessly by Earth on Oct. 31, 2015 and will return in November 2018.

Juno Probe reveals Jupiter’s Great Red Spot extends 200 miles deep.

Eight planets have been found orbiting a distant star, Kepler-90, 2,545 light-years from Earth in the Draco constellation, NASA announced Thursday.

Joann showed us the current night sky and position of the supermoon, plus other upcoming celestial events.

As there was no other business, the meeting was adjourned at 9pm. Refreshments were served on the rotunda and furnished by Hiroko and Andy Stroble.

Sincerely,

April Lew

H.A.S. Secretary
Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there’s a disaster—such as a hurricane or a large fire—they can help track what’s happening. Then, communication satellites can help us warn people in harm’s way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven’t always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America’s first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth’s seas.

Satellites also help us to study Earth’s atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites’ view from space, NASA scientists can study how the atmosphere’s layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there’s an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

(Continued on page 10)
Meteor Log—February 2018

by Tom Giguere

It is good that we have a big event just before February begins (Lunar eclipse) because February is a very quiet month for meteors. I list both the

(Continued on page 10)

<table>
<thead>
<tr>
<th>Minor Shower</th>
<th>Activity Period</th>
<th>Maximum</th>
<th>Radiant</th>
<th>Velocity</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>February Eta Draconids (FED)</td>
<td>Feb 03-Feb 06</td>
<td>Feb 04</td>
<td>315.0°</td>
<td>15:59</td>
<td>+61.0°</td>
</tr>
<tr>
<td>February Epsilon Virginids (FEV)</td>
<td>Jan 29-Feb 09</td>
<td>Feb 04</td>
<td>315.0°</td>
<td>13:24</td>
<td>+11.0°</td>
</tr>
<tr>
<td>Pi Hydrids (PIH)</td>
<td>Feb 04-Feb 15</td>
<td>Feb 07</td>
<td>318.0°</td>
<td>14:00</td>
<td>-21.0°</td>
</tr>
<tr>
<td>Omega Centaurids (OCA)</td>
<td>Feb 12-Feb 16</td>
<td>Feb 14</td>
<td>325.0°</td>
<td>13:16</td>
<td>-55.0°</td>
</tr>
<tr>
<td>Theta Centaurids (TCN)</td>
<td>Feb 12-Feb 16</td>
<td>Feb 14</td>
<td>325.0°</td>
<td>13:56</td>
<td>-29.0°</td>
</tr>
<tr>
<td>Beta Herculis (BHE)</td>
<td>Feb 13-Feb 16</td>
<td>Feb 14</td>
<td>325.0°</td>
<td>16:24</td>
<td>+25.0°</td>
</tr>
<tr>
<td>February Mu Virginids (FMV)</td>
<td>Feb 16-Mar 04</td>
<td>Feb 26</td>
<td>337.0°</td>
<td>16:12</td>
<td>-02.0°</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major Shower</th>
<th>Activity Period</th>
<th>Maximum</th>
<th>Radiant</th>
<th>$v_\infty$, $r$</th>
<th>ZHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centaurids (102 ACE)</td>
<td>1/31→02/20</td>
<td>Feb 08</td>
<td>319.2°</td>
<td>210°</td>
<td>-59°</td>
</tr>
</tbody>
</table>

If you see anything in February it will be fortunate! Tom Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.
HAS Financial Report December 10 - January 10 2017

Initial Balance: $ 1095.29

<table>
<thead>
<tr>
<th>Income</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dues Received</td>
<td>436.00</td>
</tr>
<tr>
<td>Unprocessed magazine subscription</td>
<td>34.00</td>
</tr>
<tr>
<td>Calendars sales</td>
<td>73.50</td>
</tr>
<tr>
<td>T-Shirt sales</td>
<td>15.00</td>
</tr>
<tr>
<td>Donation</td>
<td>215.00</td>
</tr>
</tbody>
</table>

Total Income: $ 773.50

<table>
<thead>
<tr>
<th>Expenses</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Snacks</td>
<td>16.20</td>
</tr>
<tr>
<td>January Astronews printing &amp; mailing</td>
<td>44.02</td>
</tr>
</tbody>
</table>

Total Expenses: $ 60.22

Ending Balance: $ 1808.57

First, a big “thank you” to all who have donated their time, talent, and treasure to HAS. Thanks also to those who have renewed. We have had more renewals than usual, because your treasurer has been sending out reminders. Let’s face it, he’s a nag.

There has been an issue with Astronomy Magazine. It’s not clear whether they have been processing subscription requests the old fashioned way (via letter and check). Therefore I have removed Astronomy as an option from the application form for the time being.

There is a further issue with membership cards. They were used for free planetarium shows. It appears the Bishop Museum no longer has such a policy. If the policy is truly dead, there is little point in having membership cards.

(Continued on page 11)
Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we’re able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1—and the decades of hard work and scientific advances since then.

To learn more about satellites, including where they go when they die, check out NASA Space Place: https://spaceplace.nasa.gov/spacecraft-graveyard

Speaking of software, Gretchen West told me about “Pocket Universe”. I downloaded the free version to check it out, and I like it, so I’ll probably spend the few bucks to upgrade. One thing that I like is that you can switch between navigating by hand and having the program show you the sky you’re pointing at. What’s your favorite astronomy app?

Chris Peterson

major and minor showers for this month. Even the “major” shower boasts only 6 meteors per hour in ideal conditions. If you see a sporadic meteor, it may be related to one of these weak sources.

At the January HAS meeting I recounted the Malia Morrow (Mike’s daughter) story of the bright daylight meteor that she observed on Christmas Eve. A meteor bright enough to be seen in daylight must be relatively large. We don’t have quite enough information to map it; it’s always best if there are multiple observers. The AMS website provides a great tool for capturing the details and compiling observations from multiple observers. If enough observers report, a very accurate altitude and trajectory can be determined. This provides information about the source of the meteor and may connect it to a shower. If the fall is over land, an area can be mapped out to look for fragments. Of course, with our abundance of water this is unlikely in Hawai‘i.
The updated roster has been sent to the Astro League. If you think you should be getting The Reflector magazine, but don’t get the March edition, let Peter know at peter@besenbruch.info.

And finally a welcome to new members Ina and Kusuru Halisi, who sail across oceans with a C6 in tow.

(Continued from page 10) Meteor Log Tom Giguere

The figure shows a meteor that was observed by six people in Arkansas. Each individual reported their own information, such as observer location, beginning and ending direction, altitude, and duration. The website is: https://www.amsmeteors.org/members/imo/report_intro. In the future, if you see a fireball please report it to the AMS website and let Mike and I know about it. We need more reports! When checking the reports there are very few from our state. The last report that I saw from Hawaii was on January 26th from “Chris C.”. It was a bright one at -12!