Jupiter from the amateurs and the Pros.
by Charles Rykken

There is a picture of the south pole of Jupiter on the last page of this issue. It was taken as part of the Juno mission with some enhanced processing by citizen scientist John Landino. I tried to track him down him to find out if he is a professional astronomer but came up with a lot of nothing. It seems his name is only connected to the picture of Jupiter’s south pole on the last page. So, maybe that photo is a collaboration of an amateur astronomer with the team of professionals that make up the Juno team. That picture was downloaded from https://www.missionjuno.swri.edu/news/juno-to-remain-in-current-orbit.

There is another example where Peter Rosén, an astronomer from Stockholm led a worldwide team of amateur astronomers and collected over 1,000 photos over a period of 102 days in 2014 to 2015. The magic happened with image processing from Christoffer Svenske and Johan Warell who produced a video that can be seen at http://www.space.com/35827-journey-to-jupiter-animation-video.html. Great things can happen with pro/amateur collaboration and let’s cheer for more of the same.
Have you ever wondered what the view would look like through a wide-angle eyepiece on your telescope? Do you have an eyepiece like that that you love and would like to show off? Do you have or want to sample any other observing equipment? If so, please let me know what you have and are willing to share at an equipment-centered star party.

I’ve been talking for a few months about having a members-night star party at Dillingham that will feature a variety of equipment that our members have and are willing to share with each other. We all salivate over the eyepieces and other things we see advertised, but most of us probably wish we could try things out before we decide whether or not to buy them. This would be a chance to do that.

From previous mentions I’ve only gotten one written reply indicating interest. If this is going to happen, I want to be sure there will be enough people participating to justify announcing the event. If you are willing to participate, please send me an e-mail (see page 2 for my address) listing any equipment you are willing to let people try out at Dillingham. This would include eyepieces, filters, and other items that others could try on their telescopes as well as your telescope itself since others might want to try their equipment on your telescope. I’ll prepare my list and present it at our March meeting, then put it in the April Astronews.

We’ll shoot for May or June if we get a good enough response. I know a lot of this goes on in an informal way, but I think many members would benefit from having a special star party when they know they’ll be able to “test drive” equipment.

(Continued on page 4)
Planets Close To the Moon
Times are Hawaii Standard Time

- Mar 1, 08h, M 3.4° SSE of Uranus (41° from sun in evening sky)
- Mar 1, 11h, M 4.1° SSE of Mars (43° from sun in evening sky)
- Mar 14, 12h, M 2.3° NNE of Jupiter (153° from sun in morning sky)
- Mar 20, 01h, M 3.4° N of Saturn (92° from sun in morning sky)
- Mar 25, 22h, M 0.11° WSW of Neptune (23° from sun in evening sky)
- Mar 28, 19h, M 3.4° SSE of Uranus (15° from sun in evening sky)
- Mar 29, 01h, M 6.3° SSE of Mercury (18° from sun in evening sky)
- Mar 30, 06h, M 5.3° SSE of Mars (35° from sun in evening sky)

Planets in March

<table>
<thead>
<tr>
<th>Mercury</th>
<th>Venus</th>
<th>Mars</th>
</tr>
</thead>
<tbody>
<tr>
<td>makes an evening appearance the last week of the month low in the west after sunset.</td>
<td>starts month shining brightly low in the west after sunset, but reaches conjunction with the sun on March 25, so not viewable late in March</td>
<td>Can be viewed low in the southwest in the evening. It is now at dimmer than +1.0 magnitude...</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Jupiter</th>
<th>Saturn</th>
<th>Uranus</th>
</tr>
</thead>
<tbody>
<tr>
<td>rises well before midnight and shines brightly in the eastern sky before dawn.</td>
<td>is below Jupiter in the eastern sky in the early morning hours.</td>
<td>can be viewed in the evening hours low in the western sky.</td>
</tr>
</tbody>
</table>

Pluto (Dwarf Planet)

- May be observed in the morning sky about 70° from the sun, but will be better viewed later in the year.

Other Events of Interest
Times are Hawaii Standard Time

- Mar 1, 17h, Neptune at conjunction with the sun (Passes into morning sky)
- Mar 6, 14h, Mercury at superior conj. with sun (Passes into evening sky)
- Mar 12, Change from standard time to daylight savings time on mainland.
- Mar 12, 04:54h, Full Moon
- Mar 20, 00:29h, Vernal or spring equinox.
- Mar 25, 10h, Venus at inferior conj. with sun (Passes into morning sky)
- Mar 27 16:58 New Moon

Venus is closer than 15° from the sun when near the moon in March.
President Chris Peterson called the February 7, 2017 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. H.A.S. Secretary Gretchen West was unable to attend the general membership meeting and as such minutes were taken by Susan Girard and later transcribed by Gretchen West.

President’s Report -

Rental Scope – H.A.S. Vice President Peter Besenbruck reports that he is still working on the rental scope. The mirror is a bit of a problem.

Equipment Demonstration Star Party- H.A.S. President Chris Peterson is looking to setting a date for an “Equipment Comparison Star Party” at Dillingham Airfield on a club star party night. He would like to get a list of members willing to bring equipment for demonstration. H.A.S. will put out a sign-up list to gauge who may be interested in participating at a May 20, 2017 or June 17, 2017 club star party. This kind of star party will be designed so that club members can bring their useful and interesting equipment and give a demonstration of their abilities. This way, members can get hands-on experience with equipment they may have been curious about. Sign-up and share.

“Club Membership Update” - H.A.S. has a new dues schedule. Due to increases in postage fees and to help meet the needs of our club, membership fees will be increasing. Those members receiving the AS-

(Continued from page 6)
Hawaiian Astronomical Society
Event Calendar

## Upcoming Star Parties

- **Public Party-Dillingham** Mar. 18 (Peter Besenbruch)
- **Public Party Geiger** Mar. 4
- **Public Party Kahala** Mar. 4

### Upcoming School Star Parties

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fri</td>
<td>March 3</td>
<td>Waimalu Elementary, Aiea</td>
</tr>
<tr>
<td>Mon</td>
<td>March 4</td>
<td>Punahou Academy, Honolulu</td>
</tr>
<tr>
<td>Fri</td>
<td>March 17</td>
<td>Ho'omaluhia Botanical Garden, Kaneohe</td>
</tr>
</tbody>
</table>

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**March 2017**

<table>
<thead>
<tr>
<th>SUNDAY</th>
<th>MONDAY</th>
<th>TUESDAY</th>
<th>WEDNESDAY</th>
<th>THURSDAY</th>
<th>FRIDAY</th>
<th>SATURDAY</th>
</tr>
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<tr>
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<td>28</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td></td>
<td>6:30 PM Waimalu Elementary Star G</td>
<td>6:37 PM Public Star Party(G)</td>
<td>6:37 PM Public Star Party(K)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>3:30 PM Board Meeting sunset</td>
<td>7:00 PM Punahou Academy Astronomy</td>
<td>Club Meeting 7:30 PM</td>
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<td></td>
<td>13</td>
<td>14</td>
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<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
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<tr>
<td>sunset 18:40</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
</tr>
<tr>
<td></td>
<td>26</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td>Globe at Night sunset 18:44</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td>Globe at Night</td>
<td></td>
<td></td>
<td>6:46 PM Public Star Party(K)</td>
</tr>
</tbody>
</table>

Globe at Night
sunset 18:34
6:30 PM Waimalu
Elementary Star G
6:37 PM Public
Star Party(G)
6:37 PM Public
Star Party(K)

6:43 PM Boy
Scouts
6:43 PM Public
Star Party(D)

6:45 PM Club Star
Party (D)

6:46 PM Public
Star Party(G)
6:46 PM Public
Star Party(K)

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**Globe at Night**

- 6:30 PM Waimalu Elementary Star G
- 6:37 PM Public Star Party(G)
- 6:37 PM Public Star Party(K)
- 6:43 PM Boy Scouts
- 6:43 PM Public Star Party(D)
- 6:45 PM Club Star Party (D)
- 6:46 PM Public Star Party(G)
- 6:46 PM Public Star Party(K)
TRONEWS in the electronic format will not have any increase in dues. Those members who wish to receive their copy of the ASTRONEWS in the hard copy format will have a increase in their membership fee.

International Observe the Moon Night – October 28, 2017 has been designated as International Observe the Moon Night. That is the night of our Kahala Park /Geiger Park Suburban Star Party night. Anyone interested in wanting to register to send in observations, from your own home, from a beach, or from one of our two scheduled star parties, is asked to contact H.A.S. President Chris Peterson.

Science Fair – The 60th Hawaii State Science and Engineering Fair will take place on April 10-12, 2017 at the Hawaii State Convention Center: Ground Floor, Exhibit I. We are in need of individuals willing to act as H.A.S. agency judges on that day. It is a fun and interesting way to spend a morning. Very little stress in the process. Please help us out and sign-up up if you will be free on that day.

H.A.S. Website Updated – The Hawaiian Astronomical Society website has recently been updated with this year’s schedule of events and new links. Peter Besenbruck is looking into other background issues.

Star Party Report – Mark Watanabe reports that we have upcoming school star parties:

March 17, 2017 – Boy Scouts – Ho`omaluhia Park, Kaneohe.

Mission Updates

Mars Exploration Mission – The European Space Agency’s Trace-gas orbiter is in a elliptical orbit but will be changed to a more circular orbit. NASA’s Curiosity rover has found that Mars used to be a warmer and wetter environment. The “Maven” is showing that Mars’ atmosphere is slowly being stripped away by the solar wind.

NASA’s Cassini mission at Saturn is doing “F” ring orbits but will make one last pass of Titan, which will change the orbit to send the spacecraft down through the ring system for a number of orbits before crashing into Saturn in September of this year.

New Horizons will fly past other Kuiper Belt objects in a few years.

Visitors – We had one visitor to this month’s meeting. Dave Ziemann, a retired oceanogapher, joined us to learn more about astronomy.

Peter B’s Presentation

Remember that there will be a spectacular total solar eclipse transiting the U.S. from west to east coasts on August 21,
On August 21, 2017, North Americans will enjoy a rare treat: The first total solar eclipse visible from the continent since 1979. The sky will darken and the temperature will drop, in one of the most dramatic cosmic events on Earth. It could be a once-in-a-lifetime show indeed. But it will also be an opportunity to do some science.

Only during an eclipse, when the moon blocks the light from the sun's surface, does the sun's corona fully reveal itself. The corona is the hot and wispy atmosphere of the sun, extending far beyond the solar disk. But it's relatively dim, merely as bright as the full moon at night. The glaring sun, about a million times brighter, renders the corona invisible.

"The beauty of eclipse observations is that they are, at present, the only opportunity where one can observe the corona [in visible light] starting from the solar surface out to several solar radii," says Shadia Habbal, an astronomer at the University of Hawaii. To study the corona, she's traveled the world having experienced 14 total eclipses (she missed only five due to weather). This summer, she and her team will set up identical imaging systems and spectrometers at five locations along the path of totality, collecting data that's normally impossible to get.

Ground-based coronagraphs, instruments designed to study the corona by blocking the sun, can't view the full extent of the corona. Solar space-based telescopes don't have the spectrographs needed to measure how the temperatures vary throughout the corona. These temperature variations show how the sun's chemical composition is distributed—crucial information for solving one of long-standing mysteries about the corona: how it gets so hot.

While the sun's surface is ~9980 Farenheit (~5800 Kelvin), the corona can reach several millions of degrees Farenheit. Researchers have proposed many explanations involving magneto-acoustic waves and the dissipation of magnetic fields, but none can account for the wide-ranging temperature distribution in the corona, Habbal says.

You too can contribute to science through one of several citizen science projects. For example, you can also help study the corona through the Citizen CATE experiment; help produce a high definition, time-expanded video of the eclipse; use your ham radio to probe how an eclipse affects the propagation of radio waves in the ionosphere; or even observe how wildlife responds to such a unique event.

Otherwise, Habbal still encourages everyone to experience the eclipse. Never look directly at the sun, of course (find more safety guidelines here: https://

(Continued on page 10)
Once again, the quiet month of March falls upon us. With only one “major” shower on the 14th of March we can turn our attention to other events. A bright meteor was seen in the Wisconsin area last month on February 6th. Here’s a summary from the American Meteor Society (AMS).

Monday, February 6th 2017, was a busy day for the American Meteor Society team. We received tens of thousands of visits on our website and even more on our Facebook page, Twitter account and Youtube account. We are still receiving reports about the large green fireball that occurred over Wisconsin around 01:31 CST (07:25 UT). With more than 480 reports so far, the AMS Event#454-2017 is the 14th largest event ever treated by the AMS since 2005. When enough reports are submitted about such an event, a trajectory of the fireball meteor can be plotted – this trajectory sometimes lead to the discovery of meteorites. This trajectory is calculated using an average of all the data shared by the witness through the online fireball reports (azimuths, elevation, etc.) The obtained trajectory can be seen on the Event page at bottom of page 10.

While we only received 165 reports, we were able to determine a first trajectory: the fireball was traveling from the Southwest to Northeast and it ended its flight on the Lake Michigan somewhere between She-

(Continued on page 11)

<table>
<thead>
<tr>
<th>First Quarter</th>
<th>Full Moon</th>
<th>Last Quarter</th>
<th>New Moon</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 5</td>
<td>March 12</td>
<td>March 20</td>
<td>March 28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shower</th>
<th>Activity</th>
<th>Maximum</th>
<th>Radiant</th>
<th>$V_\infty$</th>
<th>$r$</th>
<th>ZHR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gamma Normids (GNO)</td>
<td>02/25 → 03/22</td>
<td>Mar 14</td>
<td>354°</td>
<td>239°</td>
<td>-50°</td>
<td>56</td>
</tr>
</tbody>
</table>

Let’s all report the big ones to the American Meteor Society (AMS)! …and let Mike and Tom know as well. Tom Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.
Many thanks to those renewing their membership (Michael Baylog, Tim Kurashima, Gerald Miyasato, Gary & Eileen Ward, Andre Yanoviak).

We welcome two new members this month. They are Jack & Jenny Dougherty.

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

**A brief note on Giordano Bruno by C. Rykken**

In an article last month I claimed that one of the reasons that Giordano Bruno was burned at the stake was due to his claim that the stars were like our sun and probably had planets with life revolving about them just like our Earth revolves about our sun. I subsequently found that claim is disputed. See following: http://galileo.rice.edu/chr/bruno.html, https://en.wikipedia.org/wiki/Giordano_Bruno, and http://www.space.com/35772-copernicus-vs-catholic-church-real-story.html. The last doesn’t mention Bruno but does give some contextualization that helps show the real story is not easy.
Illustration showing the United States during the total solar eclipse of August 21, 2017, with the umbra (black oval), penumbra (concentric shaded ovals), and path of totality (red) through or very near several major cities. Credit: Goddard Science Visualization Studio, NASA

(Continued from page 7) Space Place

eclipse2017.nasa.gov/safety). But during the approximately 2.5 minutes of totality, you may remove your safety glasses and watch the eclipse directly—only then can you see the glorious corona. So enjoy the show. The next one visible from North America won't be until 2024.

For more information about the upcoming eclipse, please see:

NASA Eclipse citizen science page
https://eclipse2017.nasa.gov/citizen-science

NASA Eclipse safety guidelines
https://eclipse2017.nasa.gov/safety
boygan, WI and Manitowoc WI. The data provided by Marc Fries (NASA/NOAA) clearly indicates that this was a meteorite fall… and that it fell on the lake. If we compare the data obtained from the Doppler with the trajectory calculated from all the witnesses who filled a fireball report, the results are pretty interesting as the radar anomaly is right on the trajectory (visible flight of the meteor) and the distance between the anomaly and the end of the visible flight is only 8.85Mi (14.24km). Unfortunately, this one fell in the lake so is unlikely to be recovered.

(Continued from page 8) Meteor Log Tom Giguere

Global Warming – 2016 has been reported to have been the warmest year yet recorded. The new U.S. administration is working to remove references to ‘climate change’ from a number of government sites.

Immigrant Ban- The Trump Administration’s Immigrant Ban has caused a number of intelligent and talented students to be turned away from our borders.

Space X – A video of the Falcon 9 coming back to Earth and landing on a ocean barge was shown.

Other Rockets - More videos of Japanese and Russian rockets were viewed.

Astronaut Eugene Cernan Passes – Former U.S. Astronaut Eugene Cernan passed away January 16, 2017. He was the last man to walk on the lunar surface.

Magical Planetarium Tour – Joanne Bogan gave another wonderful sky tour across the Planetarium dome and updated us on the new additions to the Planetarium program. Thank you Joanne!

Sale – H.A.S. member Claire Levin is selling off her eyepieces and filters. Anyone interested should contact Barry Peckham.

Mahalo – As there was no further business, the meeting was adjourned at 9:13 p.m. Post meeting goodies were available in the rotunda.

Respectfully Submitted,

Gretchen West
NASA’s Juno spacecraft soared directly over Jupiter’s south pole when JunoCam acquired this image on Feb. 2, 2017, from an altitude of about 62,800 miles (101,000 kilometers) above the cloud tops. This image was processed by citizen scientist John Landino. This enhanced color version highlights the bright high clouds and numerous meandering oval storms.