

Imagination is More Important than Knowledge

by Charlie Rykken

Of course, this is not to say that knowledge is not important. I am sure we have all heard this quote from Einstein. The problem is finding the right proportions that are suited to each of our tastes. I would imagine that many if not most of the Astronews readers have some liking for science fiction. One of the early debates was how fanciful a writer should be and how much should a sense of responsibility be exercised to perform a public education service. The recent TV series “The Big Bang Theory” has a team of experts who try to insure that references to science are as close to factual as literary license will allow. Those of us who grew up on Star Trek are not so demanding of reigning in flights of fancy. When it came to Isaac Asimov vs Ray Bradbury, I chose Bradbury in a heartbeat. Recent research has shown that the right brain is the seat of pro-social behavior, while much of anti-social behavior has a home in the left brain. I think we need both sides of our brains now in these turbulent times. Both Sheldon and Laura Eisenhower are of our human family and it seems wise to make room for those who seem way too weird for words. They are people with feelings too. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3984952/>

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Upcoming Events:

The next meeting is on Tuesday, June 7th 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., June. 5th 3:30 PM in POST building at UH.

President's Message June 2016

It has been less than a century that we have had any idea how vast our universe is. We've learned that the Milky Way is but one of hundreds of billions of galaxies and that many of those galaxies are billions of light years from Earth. We have seen out in space and back in time nearly as far as we think is possible. Much attention has been paid to the biggest and most distant objects.

However, there is an increasing amount of interest these days in smaller bodies closer to home. The big telescopes in space and on Earth that are best at studying distant objects are also the ones that can find three groups of objects that we are learning much more about.

Exoplanets, those orbiting stars other than our own, are now known to be plentiful. The Kepler mission by itself has identified thousands of them, and others are finding more. We don't yet know what percentage of stars host planetary systems, but it seems quite possible that there are more planets than stars in our galaxy, and presumably in others. Some exoplanets are already being examined in search of information about their atmospheres and other characteristics. In coming decades, better space telescopes will greatly improve our understanding of these bodies.

In the outer reaches of our own solar system, we are finding more dwarf planets and other smaller objects. Most of the dwarf planets have at least one satellite of their own. The New Horizons mission, after passing Pluto, has set course for another Kuiper belt object and will observe others from a distance.

There is a good article in the June *Sky & Telescope* on the third class of objects, the Trojan asteroids. These are

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

President

Chris Peterson

956-3131

chrisp@higp.hawaii.edu

Vice President

Peter Besenbruch

peter@besenbruch.info

Secretary

Gretchen West

282-1892

gwest002@hawaii.rr.com

Treasurer

April Lew

734-2705

stardustlounge@hotmail.com

Board Members-at-Large

Calvin Oliveria

Andy Stroble

Astronews Editor

Charles Rykken

astronews@hawastsoc.org

HAS Webmasters

Peter Besenbruch

peter@besenbruch.info

Harry Zisko

harryz@pobox.com

School Star Party Coordinators

Mark Watanabe

Calvin Oliveria

The Astronews is the 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 e-mail. The deadline is the 15th of each month. We are not responsible for unsolicited artwork.

Planets Close To the Moon

Times are Hawaii Standard Time

June 1, 05h, M 2.5° SSE of Uranus
(48° from sun in morning sky)
June 3, 00h, M 0.73° S of Mercury
(24° from sun in morning sky)
June 11, 09h, M 1.4° SSW of Jupiter
(84° from sun in evening sky)
June 17, 03h, M 6.9° NNE of Mars
(147° from sun in evening sky)
June 18, 16, M 3.2° N of Saturn
(163° from sun in midnight sky)
June 25, 14h, M 1.1° NNW of Neptune
(115° from sun in morning sky)

Venus is closer than 15° from the sun when near the moon in April.

Other Events of Interest

Times are Hawaii Standard Time

June 4, 17:00h, New Moon
June 4, 23h, Mercury agreatest elongation
(24.4° west of the sun in morning sky)
June 6, 11h, Venus at superior conj. with sun
(Passes into evening sky)
June 20, 01:02h, Full Moon
June 20, 12:34h, Summer Solstice
(Diameter 18.4", Magnitude -2.1)

Planets in June

 Mercury appears in the dawn sky early in June	 Venus is too close to the sun to be viewed this month	 Mars reached opposition late last month is still well placed for viewing. Is brightest and largest early in the month.
 Jupiter can be viewed in the southeastern sky during the evening hours.	 Saturn is about 5° east of Mars in the morning sky.	 Uranus can be seen in the east before dawn.. Will be easier to observe later in the year.
 Neptune below Uranus in the predawn sky. Will be better placed for viewing in the fall.	 3-Juno (Asteroid) reached opposition on April 20, so is still in a good position to view, but is only magnitude +10.0	 Pluto (Dwarf Planet) rises before midnight, but will be better placed for viewing later in the year.

HAWAIIAN ASTRONOMICAL SOCIETY GENERAL MEMBERSHIP MEETING May 3, 2016

President Chris Peterson called the May 3, 2016 meeting of the Hawaiian Astronomical Society to order at 7:35 p.m. The meeting was held in Planetarium, on the grounds of the Bishop Museum, Honolulu, Hawaii. There were thirty-two members and four visitors in attendance.

Hawaii Space Lecture Series – This month the Hawaii Space Lecture Series presents a free lecture. Dr. Luke Flynn of the Hawaii Space Flight Laboratory will speak at the regularly scheduled 7:30 pm 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 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>.

Visitors - We had no first time visitors to this H.A.S. monthly meeting.

In the News- President Chris Peterson directed the discussion regarding Mars and its current position in the night sky.

Good viewing in the evening skies at present are Mars, Jupiter and Saturn. Chris urged all 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 or Kahala Community Park. You don't need to be a university professor to come out and have a great time helping us
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found at the L4 and L5 Lagrangian points 60 degrees ahead of or behind a planet in its orbit where their orbits are fairly stable. These were first discovered at Jupiter, but Neptune also has some. These bodies, as well as the Kuiper belt objects, may hold clues to the earliest conditions in our solar system.

When you observe the night sky, remember that there is a lot more there than you can see. Much is extremely far away, but an enormous number of bodies are tantalizingly close, close enough for our spacecraft, and eventually people, to visit and study.

Chris Peterson

Hawaiian Astronomical Society

June 2016						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
29	30	31	1	2	3	4 
			8:00 PM Globe at Night	8:00 PM Globe at Night	8:00 PM Globe at Night	8:00 PM Globe at Night 6:45 PM Club Star Party (D) (Private)
5	6	7	8	9	10	11 
8:00 PM Globe at Night sunset 18:59	8:00 PM Globe at Night	8:00 PM Globe at Night 7:30 PM Club Meeting				6:55 PM Public Star Party (G) 6:55 PM Public Star Party (K)
12	13	14	15	16	17	18
sunset 19:02						
19 	20	21	22	23	24	25
sunset 19:05						6:45 PM Public Star Party (D)
26 	27	28	29	30	1	2
sunset 19:08	8:00 PM Globe at Night	8:00 PM Globe at Night	8:00 PM Globe at Night	8:00 PM Globe at Night		

☐☐

Upcoming Star Parties

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Public Party-Dillingham June 25 (Calvin Oliveria)

Public Party Geiger June 11

Public Party Kahala June 11

Upcoming School Star Parties

		No School Parties Scheduled for June
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to share the night sky with the public.

Transit of Mercury – Many of our members will be staking out a place on the eastern shore to watch the upcoming transit of Mercury across the face of the sun on the morning of May 9th. Should the sky be cloudy, we have the liberty to view the event online.

International Astronomy Day 2016 – May 14, 2016 has been designated *International Astronomy Day*. The Hawaiian Astronomical Society will be celebrating the day with night viewing at Kahala Community Park, near Kahala Mall, and Geiger Regional Park in Ewa. Despite our best efforts, we were unable to get a response to our repeated requests to hold a daytime viewing at the mall, as we have done in years past. Oh well, their loss.

Star Party Report – Calvin Olivera reported on the March school star parties. They were as follows:

April 15 – Wahiawa -Ka’ala Elementary School star party was successful.

April 6 – Punahou School Astronomy Night - Wednesday – Punahou Academy’s Astronomy Club with high school students was also successful. Older kids asked interesting questions and had a good time.

During the month of April, H.A.S. will present the night skies to the following schools:

May 6 – Wednesday night 8th Graders at Hawaii Baptist Academy.

May 18 – Webling Elementary School.

Maryknoll students will be our guests at an upcoming Dillingham Airfield star party.

I.F.A. Open House – The Institute for Astronomy’s yearly Open House took place Sunday, April 17th. April Lew, Andy Stroble and Hiroko Stroble manned our table and provide an activity for kids. They received help from Empire Storm Troopers. Despite the drippy conditions, visitors appeared to have a good time.

Lacy Veach Day of Discovery – We will again be participating in the Lacy Veach Day of Discovery, at Punahou School, on October 29th 2016. Gretchen West will be signing people up to help with the sun spotting activity and manning the club table. Be sure to sign up at the June General Membership Meeting. We will need to turn in our count by August 1st.

Kepler Mission – The Kepler spacecraft/telescope is in solar orbit,

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If you want to collect data with a variety of instruments over an entire planet as quickly as possible, there are two trade-offs you have to consider: how far away you are from the world in question, and what orientation and direction you choose to orbit it. For a single satellite, the best of all worlds comes from a low-Earth polar orbit, which does all of the following:

- orbits the Earth very quickly: once every 101 minutes,
- is close enough at 824 km high to take incredibly high-resolution imagery,
- has five separate instruments each probing various weather and climate phenomena,
- and is capable of obtaining full-planet coverage every 12 hours.

The type of data this new satellite – the Joint Polar Satellite System-1 (JPSS-1) -- will take will be essential to extreme weather prediction and in early warning systems, which could have severely mitigated the impact of natural disasters like Hurricane Katrina. Each of the five instruments on board are fundamentally different and complementary to one another. They are:

1. The Cross-track Infrared Sounder (CrIS), which will measure the 3D structure of the atmosphere, water vapor and temperature in over 1,000 infrared spectral channels. This instrument is vital for weather forecasting up to seven days in advance of major weather events.
2. The Advanced Technology Microwave Sounder (ATMS), which assists CrIS by adding 22 microwave channels to improve temperature and moisture readings down to 1 Kelvin accuracy for tropospheric layers.
3. The Visible Infrared Imaging Radiometer Suite (VIIRS) instrument, which takes visible and infrared pictures at a resolution of just 400 meters (1312 feet), enables us to track not just weather patterns but fires, sea temperatures, nighttime light pollution as well as ocean-color observations.
4. The Ozone Mapping and Profiler Suite (OMPS), which measures how the ozone concentration varies with altitude and in time over every location on Earth's surface. This instrument is a vital tool for understanding how effectively ultraviolet light penetrates the atmosphere.
5. Finally, the Clouds and the Earth's Radiant System (CERES) will help understand the effect of clouds on Earth's energy balance, presently one of

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Last	First	Address	City	State	Zip	Telephone
Anders	Donald G.	95-146 Kuahelani Ave., Apt 266	Mililani	HI	96789-1531	
Arakawa	Jake	92-1387 Paeonia St.	Kapolei	HI	96707	205-3981
Asato	Alan, Su Yun, & Gordon	94-1113 Limahana St.	Waipahu	HI	96797	306-1594
Barina	Greg	44-102 Kauniohoka Pl.	Kaneohe	HI	96744	818-666-1701
Barnes	Jordan & Jonathan	45-002 Holowai Street	Kaneohe	HI	96744	679-7490
Baylog	Michael D.	P.O. Box 4335	Kaneohe	HI	96744-8335	
Becker	Mary J.	92-1025 Oke'a St. # 1-205	Kapolei	HI	96707-2402	
Benker	Christie	P.O. Box 11262	Lahaina	HI	96761	808-242-5408
Besenbruch	Peter	94-535 Arania Ct. #101	Mililani	HI	96789-2597	623-6235
Black & Ubby Stoddard	Robert	585 Dartmouth Ave.	San Carlos	CA	94070-1704	650-592-2166
Bloom	Gary D.	95-217 Paeonia Pl.	Mililani	HI	96789-5501	626-8258
Bogan	Joanne	45-446 Hiipoi St.	Kaneohe	HI	96744-5901	
Branchiud	Jim and Michele	45-177 Lilipuna Road, Apt A	Kaneohe	HI	96744-3002	371-6929
Brenner	Addie	3033 Woolsey Pl.	Honolulu	HI	96822-1567	988-7641
Calef	Kayoko	1624 Dole St., #1504	Honolulu	HI	96822-4848	944-1651
Chambers, Jr.	Elton J. & Lielz	P.O. Box 1420	Kaau	HI	96749-1420	808-982-9255
Chen	Johnson	P.O. Box 1858	Honolulu	HI	96805-1858	391-1818
Chiu	Vasana	659 Hahuione Street	Honolulu	HI	96825	646-284-8043
Chock	Gary	454 Luukini Place	Honolulu	HI	96817	408-921-3792
Chun	Steven	94-505 Halekua Pl.	Waipahu	HI	96797-2727	677-1819
Clemons	Nalu,Fumie, Anderson, & Nana	583 Kamoku St., Apt. 1705	Honolulu	HI	96826	348-5535
Clairmont	Susie & Toby	94-566 Holaniuku Street	Mililani	HI	96789	864-2035
Contreras	Gil	94-1051 Kalohi Loop	Waipahu	HI	96797-5410	850-384-8738
Dacus	Chris	440 Seaside Ave., #303	Honolulu	HI	96815	799-3103
Faso	Peter & Ben	55 South Kukui St., #1608	Honolulu	HI	96813	295-5401
Gallagher	John P.	91-893 Nohoiohewa Pl.	Ewa Beach	HI	96706-4031	683-0118
Galloway	Peter & Leslie	P.O. Box 42	Haw. Natl. Park	HI	96718	808-967-8583
Gallagher-Jones	Patti	1330 Ala Moana Blvd., Apt 802	Honolulu	HI	96814	
Gibson	Sandra	2005 Kau'a Road	Honolulu	HI	96815	333-8211
Giguere	Thomas A. & Betsy	92-1661 Hoiea Way	Kapolei	HI	96707-1584	672-6677
Gillcote	J. R.	Oaniani St.	Kapolei	HI	96707	
Grard	Susan M.	814 Kinau St. Apt. 204	Honolulu	HI	96813-2527	521-3676

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Grattan & Liz Tam	Mark, Ryan, & Lauren	609 Ahalea St.	Honolulu	HI	96816-4701	371-1696
Grosswendt	Hub	219 Kuahale Street	Kailua	HI	96734	261-2334
Haddock	Edward & Toni	182 Kaliko Drive	Wahiawa	HI	96786	383-4268
Hammond	Thomas, Kathy, and Simone	485 Kala Place	Honolulu	HI	96816	626-840-8937
Hansen-Stafford	Lenore	P.O. Box 2357	Ewa Beach	HI	96706-0357	341-0766
Hasegawa	Leighton & Diane	312 Akale Way	Kailua	HI	96744	375-9055
Higa	Hugo	350 Ward Ave., #106	Honolulu	HJ	96814	256-3693
Hill & Johamette Rowley	Brian	818 Koko Isle Circle	Honolulu	HI	96825	395-7807
Hood	Maurice Chuck	91-1024 Kaiopua Street	Ewa Beach	HI	96706	619-301-4449
Hughes	Robert G.	304 Akale Way	Kailua	HI	96734-4211	
Humphreys	Robert L.	2403 Orchid Street	Honolulu	HI	96816-3119	739-5195
Ikezaki	Gilbert & Margaret	P.O. Box 880164	San Diego	CA	92108	951-805-2881
Inoue	Yoshiyuki	1-15-24 Minami Horie	NISHI-KU	OSAKA,	JAPAN	81-6-6531-3760
Jones	Jane Houston & Morris	106 S. Mountain Ave., #E	Monrovia	CA	91016-3097	626-399-3323
Jongeneelen	Celeste	127 Kulalani Circle	Kula	HI	96790	878-1350
Kaichi	C.	117A Malama Pl.	Hilo	HI	96720	
Kanoo, & Kaiama Nahina	Lehualani, & Adrian	94-734 Kaaha St.	Waipahu	HI	96797	797-0633
Kawelo	Alexander	91-1080 Lolakapu St.	Kapolei	HI	96707	778-6395
Kimra	Martin C.	1888 Kalaikua Ave., Apt 3206	Honolulu	HI	96815-1535	805-934-1825
Knoop	Randy & Kathleen	1299 Hooii Circle	Pearl City	HI	96782	371-5785
Kurashima	Tim	94-663 Kaaka St.	Waipahu	HI	96797-4221	671-8884
Lajdecki	Marcin	716 Kikanni Loop	Honolulu	HI	96818	421-9947
Lawler	Paul	340-C Kawaihae St.	Honolulu	HI	96825-4238	395-8121
Lee & Lara Owczarski	Jennifer	44-306 Olina Street, #1	Kaneohe	HI	96744	
Levin	Clarice	6801 Hapuna Place	Honolulu	HI	96825-1508	395-6724
Lew	April J.	1426 Ahuwa Loop	Honolulu	HI	96816-5631	734-2705
Liu	Sineeni, Shannon, Iole, & Yvona	3865 Puakalani Place	Honolulu	HI	96816	
Livernore	Charlie	P.O. Box 849	Kailua	HI	96734-0849	230-2111
Looper	Mark, Cheryl, Luna, and David	45-536 Mihinui Road	Kaneohe	HI	96744-1706	744-7155
MacDonald	James C.	624 Akoihoa St.	Kailua	HI	96734-3909	261-2162
MacK	Dylon	7156 Hawaii Kai Dr., #212	Honolulu	HI	96825	781-9807
Manna	Michelle	2345 Ala Wai Blvd., #2710	Honolulu	HI	96815-5019	554-2831
Mariani	Albert J. & Aurora	3630 Nihipali Pl.	Honolulu	HI	96816-3307	732-8737

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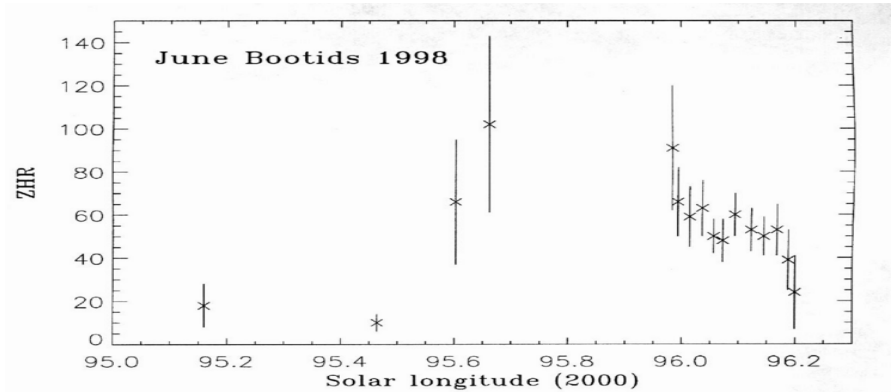
Marshall	Jameeka	84-1060 Maunaloa Street	Waianae	HI	96792	901-218-6902
McClelland, & Michael & Ann Antal	Joe , Rachel, Jim, & Karen	1870 Lusitana St., Apt. 308	Honolulu	HI	96813	222-2615
Miao	Polly	1750 Kalaheua Ave., #1505	Honolulu	HI	96826	382-6818
McMillon	Jason and Sharon	99-1315 Aiea Heights	Aiea	HI	96701	354-0054
Mihal	David and Joan	99-1315 Aiea Heights	Aiea	HI	96701	512-934-3298
Myasato	Gerald Y.	94-540 Mulehu St.	Mililani	HI	96789-2483	626-9409
Moroney	Sean	509 Kawaihoa Road	Kailua	HI	96734	262-7206
Morrow	M. J.	P.O. Box 6692	Ocean View	HI	96737-6692	
Murray	Charles & Meghan Miner	41-363 Saddle City Road, #9	Waimanalo	HI	96795	571-299-5161
Murawski	Walter	4520 – 16 th Street Place, NE	Hickory	NC	28601-8430	828-256-1272
Museller	Manfred, Evelyn, & Elizabeth	41-190 Nona Loop	Kaneohe	HI	96744	235-8630
Neff	James H.	2460 Kono Ma Drive	Pearl City,	HI	96782	455-9638
Nesterek	Evelyn	P.O. Box4654	Wheaton	IL	60189	630-639-1619
Nguyen ,	Kimberly & Hreux & Gina Ho	3362 Pany Dr.	Honolulu	HI	96822-1440	383-6161
Ohlmeister	Christopher	1754 Gulick Ave., Apt. A	Honolulu	HI	96819	393-5705
Oliveria	Calvin	7835 Savo Drive	Wahiawa	HI	96786	443-569-9036
Ota	Lisa F.	P.O. Box 985	Waianae	HI	96792-0985	255-1058
Peckham	Barry	219-A Hiliawe St.	Honolulu	HI	96813-1351	542-8658 (C)
Peterson	Chris A.	2359 St. Louis Dr.	Honolulu	HI	96816-2028	956-3131 (B)
Ploarde	Andre	98-1785 Kaunuanu St.	Aiea	HI	96701-1820	840-7536
Lee	Don A. Poole and Cynthia	725 Kapoian Blvd. #2701	Honolulu	HI	96813-6020	593-1044
Porter	Russell & Yan	98-715 Iho Pl., # 4-405	Aiea	HI	96701	480-296-1951
Pyle	Ellen	1650 Young St., Apt 804	Honolulu	HI	96826-2016	
Reinking	Greg F.	1888 Kalaheua Ave., Makai #2004	Honolulu	HI	96815-1533	979-2321
Roth	Susan & Randy	1040 Nole St.	Honolulu	HI	96816	919-490-5420
Ryken	Charles & Ann	P.O. Box 1083	Waianae	HI	96792-1083	909-389-6379
Sandbo	Larry R. and Irma	66-127 Naeiwi Ln.	Haleiwa	HI	96712	722-1752
Sandbo	Karl R., Antonija, Gabrijela, and Karl K.	824 Kinnu St., #503	Honolulu	HI	96813	520-4337
Sandor	John M.	44-135 Kahinani Way	Kaneohe	HI	96744-2569	235-4829
Shamahan	Mike	c/o Bishop Mus., 1525 Bernice St.	Honolulu	HI	96817-2704	
Shimabakuro	Eugene	95-11271 Leolani St.	Mililani	HI	96789-3608	781-7212
Shimazu	Gary M.	47-651 Halelanu St.	Kaneohe	HI	96744-5503	239-9375
Shippen	Nathaniel T., Ian, & Elizabeth	94-1453 Waiio Uka St. M-104	Waipahu	HI	96797-4647	226-4895

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Simpson	Tom & Lynn	131 Nawiliwili At.	Honolulu	HI	96825	395-0172
Spurlock	John	3633 N. Foothill Lane	Eden	UT	84310	801-791-1676
Stroble	Andy & Hiroko	2902-A Kalawao Pl.	Honolulu	HI	96822-6503	988-5764
Subramaniam	Rueban & Tiffany	P. O. Box 372063	Honolulu	HI	96837	783-9708
Swanson	Robert & Terrie	92-1101 Koio Dr., # A	Kapolei	HI	96707	630-272-1299
Takamatsu	Matthew	1021 Noio Street	Honolulu	HI	96816	226-4092
Taba	Stephany & Daniel	47-607 Hui Kelu St.	Kaneohe	HI	96744-4622	239-5590
Tobias	Brycen K-Tobias and Blast	98-1002 Palula Way	Aiea	HI	96701	753-4320
Tokushige	Walter Y.	3190 Charles St.	Honolulu	HI	96816-1417	734-5956
Traverson	Christian P.	126 Neff St., PMB #1309	Wahiawa	HI	96786	840-3243
Tyau	Nevyn, Warren, Lena, Kawai, & Chris	91-1018 Wahiho Street	Kapolei	HI	96707	
Ugelow, M.D.	Stephen A.	500 Lunalilo Home Road, PH-28G	Honolulu	HI	96825-1734	395-4825
van der Zander	Iris	1253 Kina Street	Kailua	HI	96734	561-5337
Vanaprucks	Sapavith, Selena, Susan, & Shawna	91-1058 Kekuilani Lp., C306	Kapolei	HI	96707-2726	352-2381
Villamil	Noel, Donna, & Madeleine	3138 Waialae Ave., Apt. 917	Honolulu	HI	96816-1544	835-3050
Vongsay	Enoy & Thitima	94-198 Anania Dr., #309	Mililani	HI	96789	779-5933
Ward	Gary W. & Eileen	94-335 Hakamoa St.	Mililani	HI	96789-1702	623-6236
Watanabe	Mark S.	3915 Lurline Drive	Honolulu	HI	96816-4005	735-3064
Wenzel	Duane & Joanna	47-394 Hui Iwa St., Apt 1	Kaneohe	HI	96744-4477	239-1619
West	Gretchen	4550 Aukai Ave.	Honolulu	HI	96816-4949	737-4742
Wikman	Otis A.	1612 Kamole St.	Honolulu	HI	96821-1426	
Willauer	Buzz	P.O. Box 217	Aiea	HI	96701-0217	
Wilson, M.D.	Gregory	2491 Aha Aina Pl.	Honolulu	HI	96821-1001	732-7323
Wiss	Larry N.	1253 South Beretania St. #3321	Honolulu	HI	96814-1822	236-2236
Woods & Karen Quach	Christopher	98-945 Moanalua Road, Unit 605	Aiea	HI	96701	956-778-2361
Wrathall	Jay W.	55-410 Iosepa St.	Laie	HI	96762-1105	
Yanoviak	Andre & Daunne	1279 Ulunalehe St.	Kailua	HI	96734	261-1168
Yeager	Jake & Guy	91-224 Hokuimo Pl.	Kapolei	HI	96707	721-5064
Yellin	Elissa	59-415 Kawowo Rd.	Haleiwa	HI	96712-9538	638-0510
Zisko	Harry & Melinda	1662 Paukiki St.	Kailua	HI	96734-4176	262-1947

The sole June shower is the **June Bootids (JBO)**. This shower was reinstated after the unexpected return of 1998, when ZHRs of 50-100+ were visible for more than half a day. Another outburst of similar length, but with ZHRs of ~20-50 was observed on 2004 June 23, a date before definite June Bootid activity had been recorded previously. As a result, the shower's start date was altered to try to ensure future rates that arrive this early are caught.

Observers are encourage to routinely monitor throughout the proposed period, in case of fresh outbursts. The shower's parent, Comet 7P/Pons-Winnecke, has an orbit that now lies around 0.24 astronomical units outside the Earth's at its closest approach. Its latest perihelion passage occurred on 2015 January 30. The 1998 and 2004 events resulted from material ejected from the comet in the past which now lies on slightly different orbits to the comet itself. This year, the Moon reaches its last quarter on June 27, further reducing the undisturbed time.



New Moon	First Quarter	Full Moon	Last Quarter
June 5	June 12	June 20	June 27

Shower	Activ-ity	Maximum		Radiant		V _∞	r	ZHR
		Date	λ☉	α	δ			
June Bootids (JBO)	06/22→07/02	June 27	95.7°	224°	+48°	18	2.2	Var

See one, see many – meteors are always fun to observe... Tom Giguere, 808-782-1408, thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.

HAS Financial Report April 16 – May 15 2016			
Beginning Balance	1840.11		
Income:			
	Dues Received	42.00	
	Donation	8.00	
Total Income	50.00		
Expenses:			
	March Astronews printing & mailing	119.74	
	April Astronews printing & mailing	125.57	
Total Expenses	245.31		
Ending Balance	1,644.31		

There are no new members this month. Their names are.....

Many thanks to those renewing their membership (Calvin Oliveria Charles & Ann Rykken).

NOTICE!

HAS is publishing a complete listing of Club members in the **this** issue of the *Astronews*. This publication is required by Club by-laws, Article III, Section 2 Para C(e) and Article VIII, Section 1B. Unless notified otherwise, this list will include all member's names, addresses, and phone numbers. Please be advised that this listing is intended for Club members' personal use only in contacting one another. It is not to be used for any commercial or solicitation purposes. With the exception of membership in the Astronomical League, HAS does not make this list available to, nor do we sell its contents to anyone for any purpose. Please respect our member's right to privacy.

(Space Place Continued from page 7)

the largest sources of uncertainty in climate modeling.

The JPSS-1 satellite is a sophisticated weather monitoring tool, and paves the way for its' sister satellites JPSS-2, 3 and 4. It promises to not only provide early and

(Continued on page 15)

(Continued from page 6) Meeting Minutes

taking data despite the problems. The spacecraft may be retasked to investigate a new section of space using micro-lensing by looking into the plane of the Milky Way to see more stars.

News @ Bishop Museum – There is a big change happening to the upper echelons of Bishop Museum. Blair Lee has stepped down as CEO of the museum overall and as a result the Museum will be in flux. Good news for the Planetarium is that the rotunda of the Planetarium building will have a complete overhaul and interesting new displays in addition to an improved “Science on a Sphere.”

Peter's Power Point – Vice-President Peter Bessenbruch shared that Televue is offering a 15% discount off on a great eyepiece. He also reports that mice which were taken up to the International Space Station displayed an increase in liver disease after a relatively short time in space. Concern exists for astronauts as well.

The minor planet, Makemake appears to have a satellite. The newly discovered moon provisionally designated S/2015 (13462) nicknamed Mk-2 was identified using the Hubble space telescope.

Three new exo-planet have been discovered by astronomers using the **TRAPPIST** telescope at ESO's La Silla Observatory.

Peter displayed NASA photographs of Mars with beautiful high resolution. The Dawn mission picture showed from Ceres shows Haulani Crater and the landslides that have occurred there. Dawn still has some fuel so NASA is in the process of reassigning it to a new mission and they are hoping for the funding to carry it out.

If you are in the market for a glorious set of binoculars, Peter can steer you towards a sweet pair that only costs \$3990.

Going back to Kepler, the telescope has taken some interesting infrared pictures along the plane of the Milky Way.

Rental Scope – Available for rental is our 8” with the accompanying Telrad.

Mahalo – As there was no further business, the meeting was adjourned at 8:48 p.m. Members were invited up to the viewing platform and to the dome for some post-meeting viewing. Post meeting goodies were available in the rotunda.

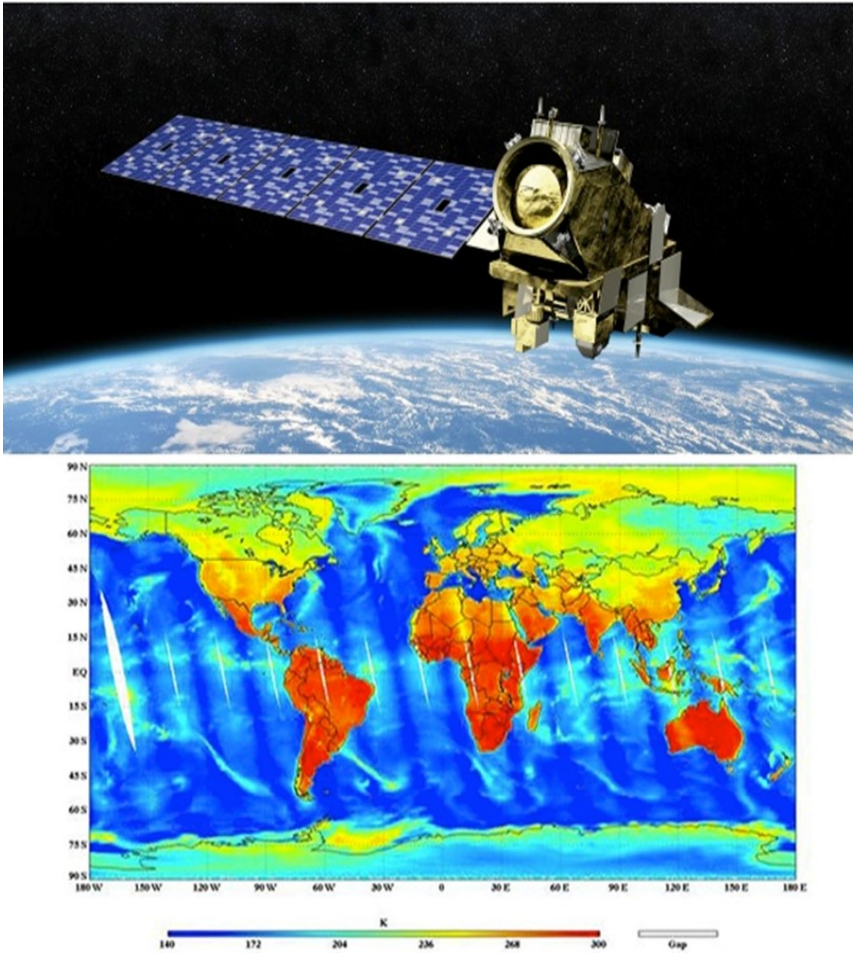
Respectfully Submitted

Gretchen West

H.A.S. Secretary

(Space Place Continued from page 14)

detailed warnings for disasters like hurricanes, volcanoes and storms, but for longer-term effects like droughts and climate changes. Emergency responders, airline pilots, cargo ships, farmers and coastal residents all rely on NOAA and the National Weather Service for informative short-and-long-term data. The JPSS constellation of satellites will extend and enhance our monitoring capabilities far into the future.



Images credit: an artist's concept of the JPSS-2 Satellite for NOAA and NASA by Orbital ATK (top); complete temperature map of the world from NOAA's National Weather Service (bottom).

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

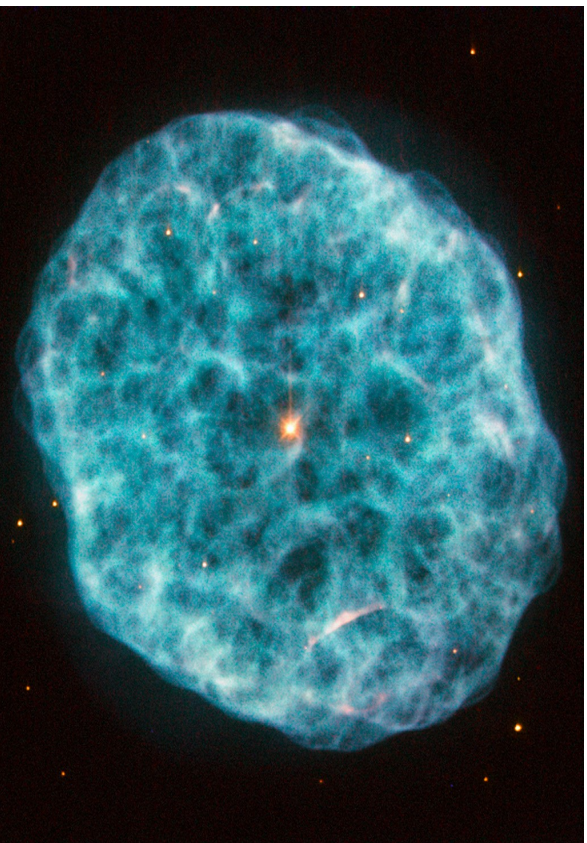


Image Credit: Hubble View of Bubbly Nebula This planetary nebula is 5,000 light-years away, appearing in the large but faint constellation of Camelopardalis, "the Giraffe." https://www.nasa.gov/mission_pages/hubble/multimedia/index.html?id=355083