



The Fractal Nature of the Universe

The speaker for the April club meeting will be Dr. Paul H. I. Coleman.

A short descriptive quote from the speaker :
 “This talk explores the Universe through the mathematical framework of fractal geometry. We will also discuss some of the resistance to these ideas that the author has encountered in the field of modern cosmology.”

In the early seventies, Paul Henry Ikaika Coleman graduated from St. Louis High School and left home in Hawai'i to attend the University of Notre Dame. There he obtained a B.S. in physics and began an almost 30-year journey throughout the world before returning to Hawai'i. He obtained a Ph.D. in 1985 from the University of Pittsburgh and has held positions with the National Radio Astronomy Observatory, Virginia Tech, The Kapteyn Astronomical Institute in The Netherlands, The Serrewacht

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A Call for Volunteers for IAU 2015

The International Astronomical Union (IAU) will be holding its annual meeting in Honolulu this year (<http://www.iau.org/news/pressreleases/detail/iau0919/>). They are looking for volunteers. You will have free access to poster sessions while not doing volunteer help. <http://astronomy2015.org/volunteer>

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Upcoming Events:

- The next meeting is on Tuesday, Apr. 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., Apr. 5 at 3:30 PM in POST building at UH.

President's Message

March 2015

I have just returned from the 46th Lunar and Planetary Science Conference in Houston, Texas. It is my 25th LPSC since I attended my first in 1990 (I missed going one year). When I started going to LPSC, planetary science was more closely related to astronomy than it seems today. I was taking spectra of the Moon from Mauna Kea, and the same kind of thing was being done for Mars. Since then, there have been so many spacecraft missions to those two bodies that it would be difficult to think of a science objective (except for observations of transient events) that now could be achieved telescopically from Earth for those two.

Of course, there are many solar system objects that don't have a resident swarm of spacecraft in orbit around them (or have even been visited once), so those objects are still in the realm of telescopic observation. At the same time, telescopes are becoming more powerful and extending our reach farther into the universe. Space-based telescopes avoid our atmosphere entirely while some Earth-bound instruments actively distort their optics to counteract turbulence in the air. Sizes of both types are still growing as well with plans for the 30-meter telescope on Mauna Kea and the James Webb space telescope moving nearer to launch.

Most amateur astronomers observe more for pleasure than for scientific advancement, so our pursuits haven't changed that much, but there have been advances in technology that impact many amateurs. Go-to mounts make it easier for those who prefer observing to finding objects. Digital imaging equipment has made imaging much easier and faster and has encouraged many more people to engage in it. Even the most conventional observ-

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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

Apr 8, 03h, M 2.1° N of Saturn
(134° from sun in morning sky)
Apr 15, 01h, M 3.5° NNW of Neptune
(46° from sun in morning sky)
Apr 19, 10h, M 3.0° SSE of Mars
(15° from sun in evening sky)
Apr 21, 09h, M 6.6° S of Venus
(40° from sun in evening sky)
Apr 26, 06h, M 5.3° SSW of Jupiter
(97° from sun in evening sky)

Mercury and Uranus are closer than 15° from the sun when near the moon in April.

Other Events of Interest

Times are Hawaii Standard Time

Apr 4, 002.06h, Full Moon
Apr 5, Easter Sunday, - First Sunday after the first full moon after the Vernal Equinox
Apr 6, Uranus at conjunction with sun.
Apr 9, 18h, Mercury at superior conj. with sun (Passes into evening sky)
Apr 18, 08:57h, New Moon
Apr 23, Lyrid meteors
(Favorable year for this major shower)
Apr 25, Spring Astronomy Day
Apr 25, 19h, Moon 0.94° W of Asteroid 3 Juno (92° from sun in evening sky)

Planets in April

<p>Mercury</p> <p>♿ can be viewed in the evening twilight during the last week of April.</p>	<p>Venus</p> <p>♀ shines brightly in the evening - about magnitude -4.1.</p>	<p>Mars</p> <p>♂ is very low in the SW evening sky.</p>
<p>Jupiter</p> <p>♃ is close to the meridian at sunset and shines brightly high in the evening sky.</p>	<p>Saturn</p> <p>♄ is visible in the southeastern sky before sunrise.</p>	<p>Uranus</p> <p>♅ reaches conjunction with the sun on Apr 6 and cannot be observed.</p>
<p>Neptune</p> <p>♆ low in the western twilight before sunrise.</p>	<p>Pluto (Dwarf Planet)</p> <p>♇ is visible in the east before dawn. Will be better placed for viewing later in the year.</p>	<p>3-Juno (Asteroid)</p> <p>♁ reached opposition on Jan 30 at magnitude +8.1.</p>

President Chris Peterson called the March 3, 2015 meeting of the Hawaiian Astronomical Society to order at 7:35 p.m. The meeting was held in the Planetarium, on the grounds of the Bishop Museum, Honolulu, Hawaii. There were thirty members and three visitors in attendance.

Hawaii Space Lecture Series – This month's lecture is scheduled for 7:30 p.m. Tuesday, March 24, 2015. Myriam Lemelin, HIGP will be the guest speaker. The title of her talk will be Volatiles at the Poles of the Moon: the Remote Sensing View of the Puzzle. 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>.

In the News – President Chris Peterson received a reply to his personal letter regarding the proposed Dillingham Ranch Development Project mentioned last month during the general membership meeting. Chris had written to the Office of Environmental Control to state his concerns regarding the lighting that would further sully the skies of Waialua/Mokuleia, should the development go forward. The letter of reply indicated "shielding (of light fixtures) is supported by the developer." We shall be monitoring the details as they become available.

Hawaii State Science and Engineering Fair 2015 - This year's Hawaii State Science Fair takes place March 23 through March 25. Chris Peterson requested help of the membership, in that we are in need of qualified members to participate as *special agency judges* to judge astronomy related Senior and Junior Research projects at this year's competition. Chris asked anyone willing to donate his or her time to see Gretchen West.

Missions – Chris Peterson gave an overview of current space missions. The Voyager Mission, Dawn Mission, and New Horizon mission were all discussed. There was also discussion of the Mercury Messenger Mission, which is out of fuel and may impact Mercury later this month





Star Party Report – John Gallagher reported on the February star parties.

March 6 - Iolani School

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Hawaiian Astronomical Society

Event Calendar

APRIL						
2015 / April						
FIRST DAY OF WEEK						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	01	02	03	 04
05 Sunset 18:49	06	07 7:30 PM Club Meeting	08	09 8:00 PM Globe At Night	10 8:00 PM Globe At Night	 11 8:00 PM Globe At Night 6:30 PM Club Star Party(D)(Private)
12 8:00 PM Globe At Night Sunset 18:52	13 8:00 PM Globe At Night	14 8:00 PM Globe At Night	15 8:00 PM Globe At Night	16 8:00 PM Globe At Night	 17 8:00 PM Globe At Night	18 8:00 PM Globe At Night 6:45 PM Public Star Party(D)
19 Sunset 18:54	20	21	22	23	24 7:15 PM Ala Wai Sch Lunar Night(Private)	 25 6:45 PM Public Star Party(G) 6:45 PM Public Star Party(K)
26 Sunset 18:57	27	28	29	30	01	02

< < **Upcoming Star Parties** > >

Public Party-Dillingham Apr. 18

Public Party Geiger Apr. 25

Public Party Kahala Apr. 25

Upcoming School Star Parties

Fri	Mar 27, 2015	Webbing Elementary School (Aiea Area)
Fri	Apr 24, 2015	Ala Wai Elementary School (Waikiki Area)
Fri	May 22, 2015	Hokulani Elementary School (UH Manoa Area)

President's Report (Continued from page 2)

ers can choose from eyepieces that outperform anything available not that many years ago.

Time marches on, and technology changes. We learn more about our universe and how it all works. One thing that hasn't changed so much is our motivation. We are curious about things and want to see as much as we can with our own eyes. But what we see just feeds the engine that drives learning and change – our imagination. That much, at least, does not need to chan

Chris Peterson

(Continued from page 4 Meeting Minutes)

March 27 – Webling Elementary

Our star party at S.W. King School in Kaneohe was called due to cloudy skies.

John continues to ask members to become more involved with the public outreach of our club. Members do not necessarily need to have a telescope to become involved. Members can come along and act as helpers, to point out objects in the sky.

Communications – “Ort” Sapavith gave an informative talk on a software application, Celly and how we can use this social networking tool to keep the viewing members of the club informed and communicating quickly and efficiently. His power point presentation was spot on and gave many a new tool to keep us up-to-date on who is doing what. Those members who want to get together on the spur of the moment to view together will now have the tools to spread the news easily and effectively. There was a short discussion to aspects of the application that can be used for email and for smart phone access. Those interested contact Ort at ortv@yahoo.com.

The Rosetta Mission - The Rosetta Mission at Churyumov-Gerasimenko (CG) and deploy a lander on its surface, showed dark shadows during a close flyby, hopes to deploy a lander on its surface.

The Dawn Mission - The Dawn probe arrived at Ceres, a Texas-size ball of ice and rock and the largest object in the asteroid belt. Dawn will continue to adjust its orbit around the dwarf planet this month, and then begin studying Ceres in detail. The probe initially photographed a bright

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For those of us in the northern hemisphere, winter brings long, cold nights, which are often excellent for sky watchers (so long as there's a way to keep warm!) But there's often an added bonus that comes along when conditions are just right: the polar lights, or the Aurora Borealis around the North Pole. Here on our world, a brilliant green light often appears for observers at high northern latitudes, with occasional, dimmer reds and even blues lighting up a clear night.

We had always assumed that there was some connection between particles emitted from the Sun and the aurorae, as particularly intense displays were observed around three days after a solar storm occurred in the direction of Earth. Presumably, particles originating from the Sun—ionized electrons and atomic nuclei like protons and alpha particles—make up the vast majority of the solar wind and get funneled by the Earth's magnetic field into a circle around its magnetic poles. They're energetic enough to knock electrons off atoms and molecules at various layers in the upper atmosphere—particles like molecular nitrogen, oxygen and atomic hydrogen. And when the electrons fall back either onto the atoms or to lower energy levels, they emit light of varying but particular wavelengths—oxygen producing the most common green signature, with less common states of oxygen and hydrogen producing red and the occasional blue from nitrogen.

But it wasn't until the 2000s that this picture was directly confirmed! NASA's Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) satellite (which ceased operations in December 2005) was able to find out how the magnetosphere responded to solar wind changes, how the plasmas were energized, transported and (in some cases) lost, and many more properties of our
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patch on the surface of Ceres, which was later photographed in more detail. The bright patch resolved showing two bright patches within a larger crater.

The club is so very lucky to enjoy the views of the night sky as Joanne Bogan guides us across the heavens. Thank You, Joanne!

Mahalo – As there was no further business, the meeting was adjourned at 9:47 p.m.

Gretchen West
H.A.S. Secretary

The winter meteor shower drought is broken with the April Lyrids, which reach maximum on the 22nd. It really is the doldrums because the last major shower was the Quadrantids, back on January 3rd. Maybe this gap in large activity is the best time to look for sporadic meteors!

The Lyrids (LYR) peak on April 22nd with an average zenith hourly rate of 18 meteors. This peak is idealized for an observer in dark skies with the meteor shower directly overhead. With Hawaii's typical conditions of clouds, moisture, and moderate light pollution we would be very satisfied to see half of this peak. A ZHR of 18 is not the same every year. The IMO analyzed Lyrid activity for a thirteen year period, starting in 1988, and determined the ZHR varied from about 14 to a high of 23. It has been suggested (Esko Lyytinen) that 2015 rates could be elevated based on the a single return of parent comet, C/1861 G1 Thatcher. Rates could even be better in 2016 and 2017. Meteor rates often seem to be unreliable, as the dust production rates are usually not very well known.

Let's take a look at some of the columns in the meteor table below. I'll break it into two sections and define the first four columns this month and the remaining four next month.

The first three columns are straight forward (Shower, Activity, Maximum

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First Quarter		Full Moon		Last Quarter		New Moon		
April 25		April 4		April 12		April 18		
Shower	Activi- ty	Maximum		Radiant		V_{∞}	r	ZHR
		Date	$\lambda \odot$	α	δ			
Lyrids (LYR)	4/16→ 4/25	(Apr 22)	32.32°	271°	+34°	49	2.1	18
π - Puppids (PPU)	4/15→ 4/28	(Apr 23)	33.5°	110°	-45°	18	2.0	Var

“April showers, bring May flowers” ... and also Lyrid meteors! Tom Giguere, 808-782-1408, Thomas.giguere@yahoo.com; Mike Morrow, PO Box 6692, Ocean View, HI 96737.

HAS Financial Report February 16, 2015 to March 15, 2015			
Beginning Balance	2,706.41		
Income:			
	Dues Received	126.00	
	Donation	8.00	
Total Income	134.00		
Expenses:			
	March Astronews printing & mailing	173.30	
Total Expenses			173.30
Ending Balance			2,667.11

. We welcome two new members this month. They are *Gilbert & Margaret Ikezaki* donation \$8.00.

Many thanks to those renewing their membership (Ellen Pyle, Michael Manna, John Spurlock, (Noel, Madeline, & Donna) Villamil). As a reminder, please check your membership anniversary date listed on the Astronews address label. Clear skies to all!

(Continued from page 8) Meteor Log
Date) so I will start with the definitions of these columns.

Shower: The shower is named for the constellation from which the meteors seem to emanate, along with the greek letter of the closest star in the constellation. A unique three letter code serves as an abbreviation for the shower. The shower may also have a three digit IAU Meteor Data Center number, the
(Meteor Log Continued on page 11)

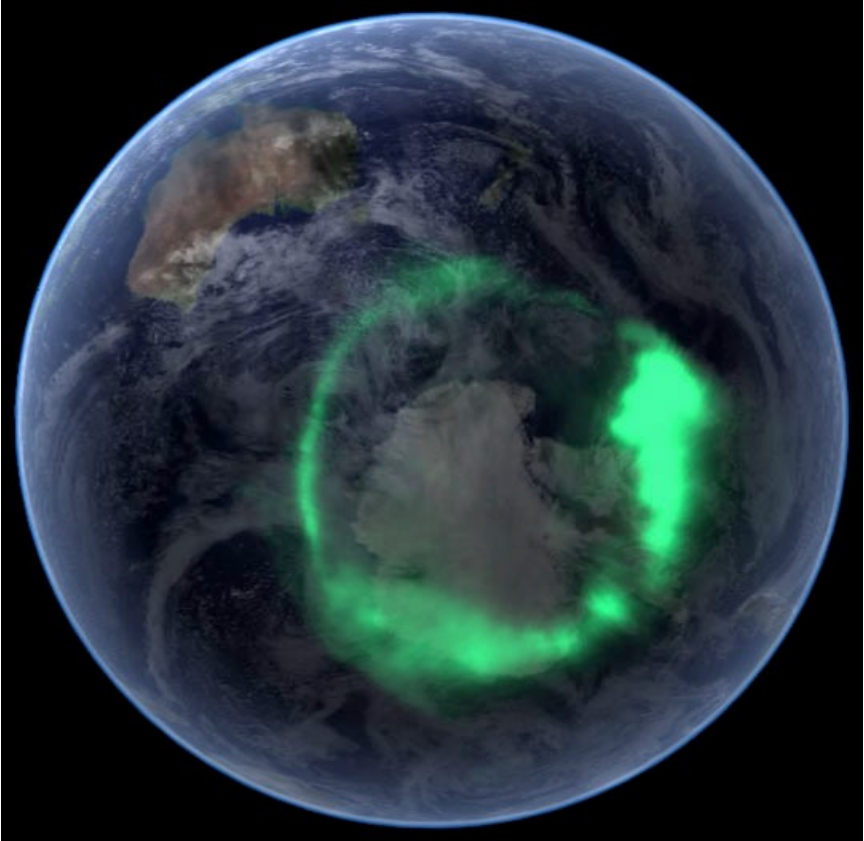
(Coinued from page 1)
(Observatory) in Leiden, New Mexico Tech, The Very Large Array in New Mexico, Yale University, The University of Puerto Rico, and The Arecibo Observatory.

Paul is currently an astrophysicist/specialist at the Institute for Astronomy where he engages in outreach, does research, and teaches astronomy. He oversees the Faulkes Telescope North, the world's largest telescope dedicated to K-12 students in England and Hawai`i. He is the director of the IfA's Research Experience for Undergraduates summer program (REU) and is a member of the University's Kualii Council, a body of Native Hawaiian professors, instructors, and graduate students at the Manoa campus..

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magnetosphere. Planets without significant magnetic fields such as Venus and Mars have much smaller, weaker aurorae than we do, and gas giant planets

like Saturn have aurorae that primarily shine in the ultraviolet rather than the visible. Nevertheless, the aurorae are a spectacular sight in the evening, particularly for observers in Alaska, Canada and the Scandinavian countries. But when a solar storm comes our way, keep your eyes towards the north at night; the views will be well worth braving the cold!



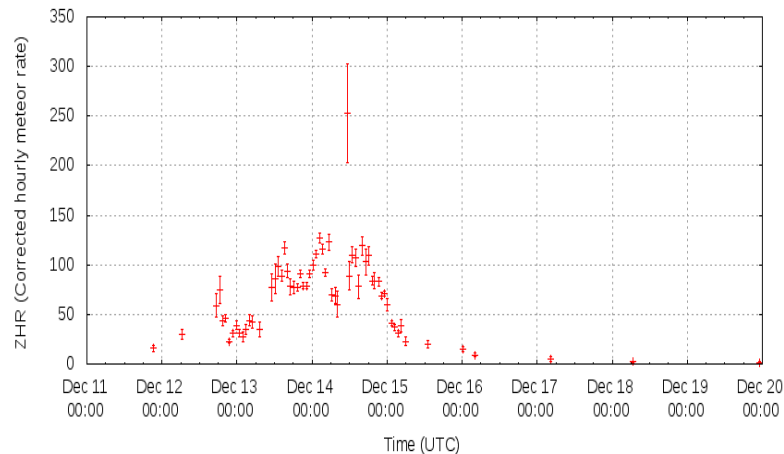
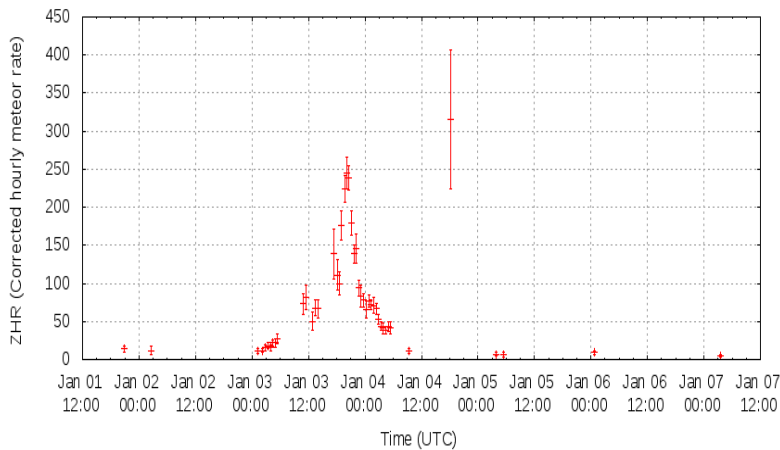
Auroral overlays from the IMAGE spacecraft.

Image credit: NASA Earth Observatory

(Goddard Space Flight Center) / Blue Marble team.

(Continued from page 9) Meteor Log
Lyrids are 006.

Activity: The activity is the period of time in which you are likely to see a meteor from this shower. The closer to the maximum date, the more likely your chances are. Showers have differing distributions of meteors within this stated period. Most showers have a strong peak around the



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Place cover
up this snudge
with some-
thing. A post-
age stamp is
suggested..



Hot Stuff : Oldie but Goodie from August 31, 2012

Image Credit: Credit: NASA/GSFC/SDO

http://www.nasa.gov/mission/_pages/sunearth/news/News090412-filament.html