The Astronews

HUI KILOLANI

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The Hokulani Imaginarium

by Joseph Ciotti

Director, Center for Aerospace Education

From the Editor: While the Bishop Museum is being renovated, we are fortunate enough to be hosted on Dec. 4 by our friends at the Windward Community College Center for Aerospace Education.
If you have not yet been to the facility, it's a right turn after you enter the main campus, then follow the road around to the back area. The planetarium is on the left, parking to the right.

Situated in Kāneʻohe at the foot of the Koʻolau mountains, Windward Community College's Hōkūlani Imaginarium is one of four educational facilities operated by the college's Center for Aerospace Education (CAE). When it officially opened in October of 2001, the Imaginarium ushered in a new era of fulldome planetariums in the state of Hawaiʻi.

Back then, its original Evans & Sutherland DigiStar II projector was capable of displaying only monochromatic, calligraphic, wire-frame images onto the theater's 40-foot dome. The computer systems of that period were not powerful enough to project bit-mapped, fully textured, colored images across such a large screen.

Major leaps in computer and video technology during the subsequent decade have brought fulldome to the forefront and heightened the dilemma of choosing between optical-mechanical and digital fulldome planetarium systems. This quandary closely parallels the film-versus-digital photography controversy.

In October 2010, the Imaginarium's projector was upgraded to a Definiti DigitalSky 2 system produced by Sky-Skan. Unlike DigiStar II and optical-mechanical systems that dominate the theater's central space and partially obstructed the audience's view, this new digital 4K fulldome system consists

(Continued on page 11)

Inside this issue:

President's Message	3
NASA Space Place	4
Meteor Log	5
Oberserver's Notebook	6
Minutes	7
Calendar	8
Star Parties	10
Treasurer's Report	10

Upcoming Events:

☆The next meeting is 7:30PM on **Tues., Dec. 4** at ***Windward CC Hokulani Imaginarium***

☆Planetarium shows with **Barry Peckham** are ON HOLD during the renovation. www.bishopmuseum.org/calendar

☆The next Board Meeting is Sun., **Dec. 2** at 3:30 p.m. at the POST building at UH.

Up To The Minute:

DARPA WANTS ARMY OF NETWORKED AMATEUR ASTRONOMERS TO WATCH SKY FOR SPACE JUNK

A blog from Network World reports that there is so much junk floating around in space the government needs help keeping track of it all. The Defense Advanced Research Projects Agency (DARPA) recently announced a program to utilize amateur astronomers to help watch space for any dangerous junk that maybe be threatening satellites or other spacecraft and even the Earth. You may use your own telescope, but the program may even install equipment if you are in a strategic area the government wants to survey.

DARPA's program, known as SpaceView, is strategically aimed at offering more diverse data to the Space Surveillance Network (SSN), a U.S. Air Force program charged with cataloging and observing space objects to identify potential near-term collisions.

With SpaceView DARPA will provide "state of the art hardware and relatively minor financial compensation may be provided in exchange for the shared telescope time, site security, and routine maintenance. This will allow SpaceView to significantly reduce deployment costs when compared to traditional optical space-surveillance facilities. Equally important, remote observing and the availability of the local SpaceView member for troubleshooting eliminates the need for any paid employees at the site, further decreasing operational costs," DARPA stated.

According to the agency, SpaceView is in its initial developmental phase which consists of developing the network architecture and demonstrating the ability to remotely and automatically operate a network of sites from a central location. A large part of

(Continued on page 3)

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The Astronews is a 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 email. The deadline is the 16th of each month. We are not responsible for unsolicited artwork.

President's Message

by Chris Peterson

If you want to be ready for the next pass of the International Space Station, there is a new and easy way to get alerts. NASA has started providing notification by e-mail or text message a few hours before each good pass over 4,600 locations worldwide. Just go to ***http://spotthestation.nasa.gov/index.cfm*** and provide your location and e-mail address or phone number. You can choose evening, morning, or both types of passes. You will only be alerted to "good" passes; that is, those that reach at least 40 degrees above the horizon. The message will include the start time, duration, maximum height, and direction where the station appears and disappears. This is not quite as much information as you can get from web sites such as Heavens-Above, but you get it automatically for a year unless you cancel or extend your request.

Remember that at our December meeting at the Imaginarium we will be voting for our club officers. There is still time to throw your hat into the ring if you'd like to serve the club. Ours is an organization that has a proud heritage of service to the community, and I have felt privileged to serve as you President. It seems that the only way we usually get candidates for office is by strong-arming them (that's how I was recruited!), so don't be surprised if I collar you some day to persuade you to join the board of directors. For now, though, all the present board members have agreed to run again. It would be nice to have a contested election again, though, even if for only a single office.

We're planning to have another potluck dinner before January's meeting. It was a great success last time we did it. This time we have a special occasion to celebrate: the grand re-opening of the Bishop Museum Planetarium. I encourage everyone to attend both the December and January meetings to see the differences between the new systems at the Imaginarium and the Bishop Museum. I'm sure neither will disappoint, but it's seldom that most of us will have the chance to sample two newly renovated planetariums in such a short time, and for free! Happy holidays.

Chris

developing the network architecture consists of determining the needs of the amateur astronomy community so that these needs can be aligned with the space surveillance needs of SpaceView, DARPA stated.

If you are interested in signing up go to http://www.spaceviewnetwork.com/register/

According to DARPA, by providing contact information and the answers to a few basic questions you will be helping to begin the process of gathering the information needed to develop the network architecture concept. Once your information has been received by SpaceView, interested parties will most likely receive a link via email to a questionnaire requesting more detailed information about your astronomy background, observing habits, as well as other demographic information. This information will be used by SpaceView to determine the habits and needs of candidate network members.

Examples of what NASA calls orbital debris include: "Derelict spacecraft and upper stages of launch vehicles, carriers for multiple payloads, debris intentionally released during spacecraft separation from its launch vehicle or during mission operations, debris created as a result of spacecraft or upper stage explosions or collisions, solid rocket motor effluents, and tiny flecks of paint released by thermal stress or small particle impacts."

NASA estimates more than 500,000 pieces of hazardous space debris orbit the earth, threatening satellites that support peacekeeping and combat missions. ☆

It Takes More Than Warm Porridge to Make a Goldilocks Zone

By Diane K. Fisher

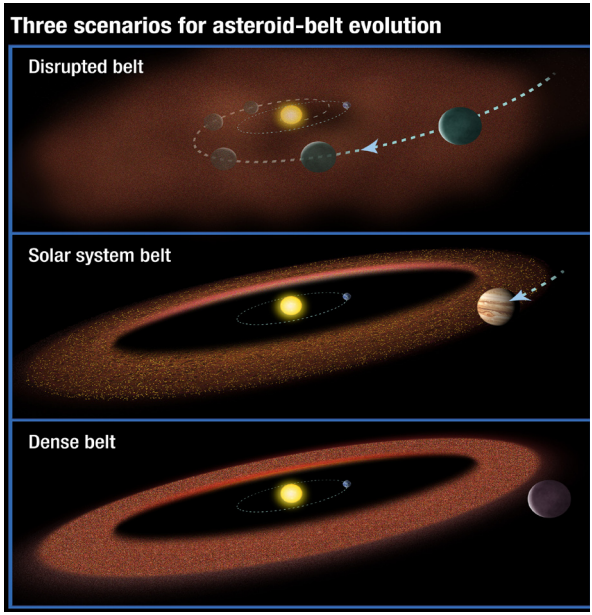
The "Goldilocks Zone" describes the region of a solar system that is just the right distance from the star to make a cozy, comfy home for a life-supporting planet. It is a region that keeps the planet warm enough to have a liquid ocean, but not so warm that the ocean boils off into space. Obviously, Earth orbits the Sun in our solar system's "Goldilocks Zone."

But there are other conditions besides temperature that make our part of the solar system comfortable for life. Using infrared data from the Spitzer Space Telescope, along with theoretical models and archival observations, Rebecca Martin, a NASA Sagan Fellow from the University of Colorado in Boulder, and astronomer Mario Livio of the Space Telescope Science Institute in Baltimore, Maryland, have published a new study suggesting that our solar system and our place in it is special in at least one other way.

This fortunate "just right" condition involves Jupiter and its effect on the asteroid belt.

Many other solar systems discovered in the past decade have giant gas planets in very tight orbits around their stars. Only 19 out of 520 solar systems studied have Jupiter-like planets in orbits beyond what is known as the "snow line"—the distance from the star at which it is cool enough for water (and ammonia and methane) to condense into ice. Scientists believe our Jupiter formed a bit farther away from the Sun

(Continued on page 9)



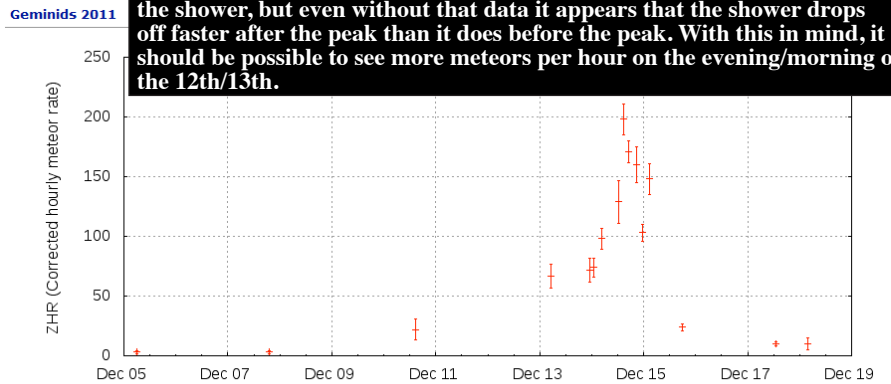
Of three possible scenarios for the position of Jupiter vis à vis the asteroid belt, only one works in our favor. Our solar system is represented by the middle scenario, where the gas giant planet has migrated inward, but still remains beyond the asteroid belt.

Credit: NASA

December features a flurry of small meteor showers along with one of the year's best shower, the Geminids (GEM). The holidays bring many distractions, so it is often difficult to find the time to observe.

The Geminids are worth making an extra effort. This shower is one of the most consistent of the year and often puts on a nice show; hourly rates have been higher than the August Perseids in recent years. The shower peak falls during the new moon this year on December 13 at 23:30 UT, which is 1:30pm in the afternoon local time. So, in theory we will have an equal show on either Wednesday morning or Thursday morning. Most of us don't have the luxury of observing for two nights, but which night will be best? Let's examine the compiled reports for the 2011 Geminids (see chart below):

It would be nice to have more data for the period following the peak of the shower, but even without that data it appears that the shower drops off faster after the peak than it does before the peak. With this in mind, it should be possible to see more meteors per hour on the evening/morning of the 12th/13th.



Last Quarter	*New Moon*	*First Quarter*	*Full Moon*
Dec 06	**Dec 13**	**Dec 20**	**Dec 28**

Shower	Activity	Max Date	λ 2000	Radiant α	Radiant δ	V∞ km/s	*r*	ZHR
Phoenicids (PHO)	11/28 - 12/09	Dec 06	254.25°	18°	-53°	18	2.8	Var
Puppid/Velids (PUP)	12/01 - 12/15	(Dec 06)	(255°)	123°	-45°	40	2.9	10
Monocerotids (MON)	11/27 - 12/17	Dec 08	257°	100°	-08°	42	3.0	2
δ-Hydrids (HYD)	12/03 - 12/15	Dec 11	260°	127°	+02°	58	3.0	3
Geminids (GEM)	12/07 - 12/17	Dec 13	262.2°	112°	+33°	35	2.6	120
Coma Berenicids (COM)	12/12 - 12/23	Dec 15	264°	175°	+18°	65	3.0	3
Dec Leonis Minorids (DLM)	12/06 - 02/04	Dec 19	268°	161°	+30°	64	3.0	5
Ursids (URS)	12/17 - 12/26	Dec 23	270.7°	217°	+76°	33	3.0	10

The meteor observing group will observe this shower from central Oahu, please give a ring if you'd like to join us! ***Tom Giguere***, 808-782-1408, thomas.giguere@yahoo.com;
Mike Morrow, PO Box 6692, Ocean View, HI 96737.

Planets Close To the Moon

Times are Hawaii Standard Time

Dec 10, 00h, M 4.0º SSW of Saturn
(41° from sun in evening sky)

Dec 11, 04h, M 1.7° S of Venus
(25° from sun in morning sky)

Dec 11, 14h, M 1.1° SSW of Mercury
(19° from sun in morning sky)

Dec 14, 21h, M 5.5º NNW of Mars
(27° from sun in evening sky)

Dec 17, 20h, M 5.8º NNW of Neptune
(64º from sun in evening sky)

Dec 20, 09h, M 4.8º NNW of Uranus
(95º from sun in evening sky)

Dec 25, 14h, M 0.42º S of Jupiter
(154º from sun in evening sky)

Other Events of Interest

Times are Hawaii Standard Time

Dec 2, 16h, Jupiter at Opposition

Dec 4, 13h, Mercury at Greatest Elongation
(20.5° west of the sun in morning sky)

Dec 8, 16h, 4 Vesta at Opposition

Dec 12, 22:41 h, Moon New

Dec 13 Geminid Meteors
(Favorable year for this major shower)

Dec 17, 20h, 1 Ceres at Opposition

Dec 21, 01:12h, Winter Solstice

Dec 28, 00:22 h, Moon full

Dec 29, 23h, Pluto at Conjunction with sun (Passes into morning sky)

Mercury Visible in the morning sky the first two weeks of the month. Close to the moon on Dec 11.	**Venus** Shines brightly low in the southeast before dawn.	**Mars** Mars is now too close to the western horizon after sunset to be seen crisply.
Jupiter Reaches opposition on Dec 2 and is in the sky all night. This is the best month of the year for viewing the largest planet.	**Saturn** Moves further to the west of Venus in the morning sky after a close approach at the end of November..	**Uranus** Uranus is visible in the evening sky in the south-west after sunset.
Neptune Can be viewed low in the southwest in the early evening.	Asteroid **4-Vesta** Reaches opposition on Dec 8 at magnitude +6.4, an easy binocular object.	Asteroid **1 Ceres** Reaches opposition on Dec 17 at magnitude +6.7, also an easy binocular object.

Meeting Minutes

by Gretchen West

President Chris Peterson called the November 6, 2012 meeting of the Hawaiian Astronomical Society to order at 7:40p.m. The meeting was held inPaki Hall on the grounds of the Bishop Museum.

Melinda Zisko update: Chris mentioned that member ***Melinda Zisko*** had recently had a stroke and encouraged folks to give her and hubby ***Harry*** support and encouragement during this difficult time.

Planetary Data Center: Chris said he had not yet received the notice of the upcoming lectures yet, so anyone interested should contact the Data Center.

Donated scope: An 8" Coulter Odyssey scope has been donated to the club and, after it has been cleaned up and checked out, it may be placed up for auction at a later meeting.

Observatory scope: Chris announced that the Bishop Museum Observatory scope was refurbished and repaired by ***Jim MacDonald and Barry Peckham*** and is now back in operation.

Karsten Thot Bridge: Chris said the Karsten Thot bridge in Wahiawa is now open for travel, however they are still working on it, so members are encouraged to use caution when crossing.

Lacy Veach Day: Gretchen West reported that the recent Lacy Veach Day was a success and thanked all members who volunteered to help out.

HAS meeting for December: Chris mentioned that the December meeting of HAS will probably be held at the Imaginarium at Leeward College, although he had not yet gotten a confirmation. An announcement will be in the newsletter.

January HAS potluck meeting: HAS plans to have a potluck dinner before the January meeting to celebrate the opening of the planetarium and also to take a club picture. All HAS members are encouraged to attend this event and bring a dish to share. Details will be in the newsletter.

Books: The four books donated to the club by Michael Chauvin are now in possession of Jim MacDonald who will give them to new members as requested.

Yearly Elections: HAS elections for the Board of Directors will take place at the December meeting. Anyone interested in running for a place on the board or who would like to nominate a member for election should contact ***Joanne Bogan*** who has graciously accepted to be the elections chair this year. Nominations will be accepted at the December meeting as well.

Total Solar Eclipse: Chris mentioned the Total Solar Eclipse which will take place in the South Pacific near Australia/New Zealand on Nov 13. He also said there would be a Lunar eclipse on Nov 28th early in the morning.

Visitors: There were two new members (***Mickie Stash and Bob Kern***) in attendance who just joined the club and were attending their first meeting.

Club shirts and memberships: ***Jim MacDonald*** reminded everyone that he will be sending in an order for club polo shirts soon and this was a last call for orders. He also reminded everyone to renew club and magazine subscriptions for the coming year.

(Continued on page 9)

List View Past Events < **December 2012** > Upcoming Events Add/Log Event

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
25	26	27	28	29	30	1 Sunset: 5:50 PM
2	3	7:30 PM Club Meeting 4	5	6	7	5:15 PM Club Star Party (D) 8 Sunset: 5:51 PM
9	10	11	12	13	14	5:15 PM Public Star Party(D) 15 Sunset: 5:54 PM
16	17	18	19	20	21	5:30 PM Public Star Party(K) 22 5:30 PM Public Star Party(G) Sunset: 5:57 PM
23	24	Christmas Day 25	26	27	28	29 Sunset: 6:00 PM
30	31	1	2	3	4	5

Star Party Report *by Sue Girard*

Dillingham Club Star Party - Sept 8, 2012

The Nov Club Star Party started out a bit cloudy, but the clouds soon parted as the temperature fell and revealed a very beautiful sky. There was some moisture in the air and it resulted in less transparency than wished resulting in haze around many of the bright stars. We had a pretty good turnout of members - about a dozen came in spite of some cloudiness over O'ahu. The Milky Way made it's appearance early and we were treated to some nice sporadic meteors. With the setting of the Summer constellations, we turned toward the East and North to catch the gems around Pegasus, Cassiopeia, Cygnus, and Lyra. The carbon star T Lyrae had a very nice reddish hue. I noticed that the "double double"(Epsilon Lyrae) could be split nicely. NGC 7331 and its accompanying faint galaxies (Deer Lick group) also were just visible in my 10" Dobs. Jupiter made its appearance about 8:15pm through the trees as it rose in the East. Clouds started forming and a few drops started coming down, so we decided to exit the field rather than take the chance of getting caught in a shower while trying to breakdown. It turned out to be the right decision because we drove home through sporadic showers.

Sue

(Space Place continued from page 4)

than it is now. Although the giant planet has moved a little closer to the Sun, it is still beyond the snow line.

So why do we care where Jupiter hangs out? Well, the gravity of Jupiter, with its mass of 318 Earths, has a profound effect on everything in its region, including the asteroid belt. The asteroid belt is a region between Mars and Jupiter where millions of mostly rocky objects (some water-bearing) orbit. They range in size from dwarf planet Ceres at more than 600 miles in diameter to grains of dust. In the early solar system, asteroids (along with comets) could have been partly responsible for delivering water to fill the ocean of a young Earth. They could have also brought organic molecules to Earth, from which life eventually evolved.

Jupiter's gravity keeps the asteroids pretty much in their place in the asteroid belt, and doesn't let them accrete to form another planet. If Jupiter had moved inward through the asteroid belt toward the Sun, it would have scattered the asteroids in all directions before Earth had time to form. And no asteroid belt means no impacts on Earth, no water delivery, and maybe no life-starting molecules either. Asteroids may have also delivered such useful metals as gold, platinum, and iron to Earth's crust.

But, if Jupiter had not migrated inward at all since it formed father away from the Sun, the asteroid belt would be totally undisturbed and would be a lot more dense with asteroids than it is now. In that case, Earth would have been blasted with a lot more asteroid impacts, and life may have never had a chance to take root.

The infrared data from the Spitzer Space Telescope contributes in unexpected ways in revealing and supporting new ideas and theories about our universe. Read more about this study and other Spitzer contributions at spitzer.caltech.edu. Kids can learn about infrared light and enjoy solving Spitzer image puzzles at spaceplace.nasa.gov/spitzer-slyder.

☆

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

(Minutes continued from page 7)

Star Party Report: ***John Gallagher*** passed the volunteer clipboard for a cub scout star party at Schofield Barracks on Fri Nov 16th. John said he would need help with the Geiger park public star party on Sat Nov 24th since they will be short of the usual volunteers. He also mentioned a new website that members may want to check out 'www.teachastronomy.com' as a source of teaching information.

Speaker: Our speaker for the evening was noted local astrophotographer Freddy Willems. He presented a very interesting and informative dissertation on planetary imaging. Freddy explained the equipment he uses to photograph (webcam)and the software (mostly free) to process the images into some very spectacular and detailed pictures of Jupiter, Saturn, Mars and the Moon. He does most all of the his imaging from his observatory at home in Waipahu. He is most willing to share information on how he accomplishes this with any members who are interested and encourages them to contact him.

Respectfully Submitted,

Susan Girard

(substituting for Gretchen West)

Treasurer's Report

by Jim MacDonald

HAS Financial Report for the month ending as of Nov. 15, 2012

Initial Balance:	**$4,105.29**
Receipts:	
T-Shirt Sales	15.00
Donations	60.00
Dues Received	150.00
Calendars	6.50
Polo Shirt Deposit	155.05
Check Reimbursement	35.00
Magazine Payment	133.90
Telescope Rental/Deposit	40.00
Total Income:	**$595.45**
Expenses:	
Astronews	59.89
Magazine Subscription	216.18
Postage (2 mos.)	147.70
Total Expenses:	**$423.77**
Final Balance	**$4,276.97**

The club gained seven new members this month. They are ***Grzegorz Glaz; Roel Bayudan and Naomi Laxan; Fred, Yen, Natasha, and Nikkita Bandack.*** Thanks also to ***Grzegorz Glaz and Fred Bandack*** for their donations. ***We*** appreciate all of those who remembered to renew their membership on time.

<<Upcoming Star Parties>>

CLUB Party-Dillingham	**Dec. 8** (Peterson)
Public Party-Dillingham	**Dec. 15** (Girard)
Kahala/Ewa Party	**Dec. 22**

☆ ☆ Upcoming School Star Parties ☆ ☆

		***Happy Holidays***
		No school programs for the rest of 2012!
		2013
Fri	**1/18**	Waikiki Elementary (Honolulu)

(Imaginarium continued from page 1)

of two JVC video projectors mounted in the planetarium's north and south cove. By removing the now obsolete central projector pit, the Imaginarium has increased its seating capacity to 83. Where once the Digistar II sat, an additional 17 seats now reside in the planetarium's prime viewing area. Theater seating is unidirection and includes designated areas for four wheelchairs.

In order to achieve images of high contrast without sacrificing brightness, two JVC model SH7 projectors were selected. One projector fills the south portion of the dome, while the oppositely-mounted projector handles the north section. Software and mechanical masks provide a nearly seamless blend where the two images overlap.

To display images at 60 frames per second, the DigitalSky 2 system relies on a bank of ten high-end computers. The master computer issues commands to eight PCs, which render in real-time or playback mode the visuals displayed on the dome. The tenth PC is fully dedicated to audio. The theater's original 5.1 analog sound system was upgraded last year to digital with headset accommodations for the hearing impaired and multi-languages. An ancillary JVC RS2 projector is mounted in the cove to independently project images with PowerPoint and other external systems.

Besides serving WCC students enrolled in its astronomy and Polynesian voyaging classes, the Imaginarium is visited by K-12 schools and the general public. Approximately 15,000 visitors tour the CAE facilities annually. Currently, three general public shows are scheduled monthly at 7 pm. A live sky show is offered on the first Wednesday of each month by Krissie Kellogg, with a general public show on the second Friday and a family show on the fourth Friday. The Imaginarium also sponsors special events, like Haunted Village at Halloween.

Besides the Imaginarium, the CAE operates three other outreach facilities:

• Aerospace Exploration Laboratory is a "hands-on" science exploratorium for K- 6 students.

• NASA Fight Training Aerospace Education Laboratory provides flight-simulators for training in aviation and space exploration.

• Lanihuli Observatory features log-periodic, steerable radio telescope, a Meade LXD55 6" refractor that is equipped with a SolarMax 90mm H-Alpha filter and 16" Meade LX200 optical telescope, computer-controlled on a permanent equatorial fork-mount fixed on a raised platform in a separate observing room. Lanihuli also operates a NOAA weather satellite tracking station, an on-site weather facility and a cosmic ray telescope in conjunction with the national QuarkNet group. The observatory's control room duplicates as a Visitor's Gallery with astronomy kiosks and a 2-foot diameter Magic Planet interactive display.

For more information on the Imginarium visit our web site at http://aerospace.wcc.hawaii.edu/imaginarium.html . ☆

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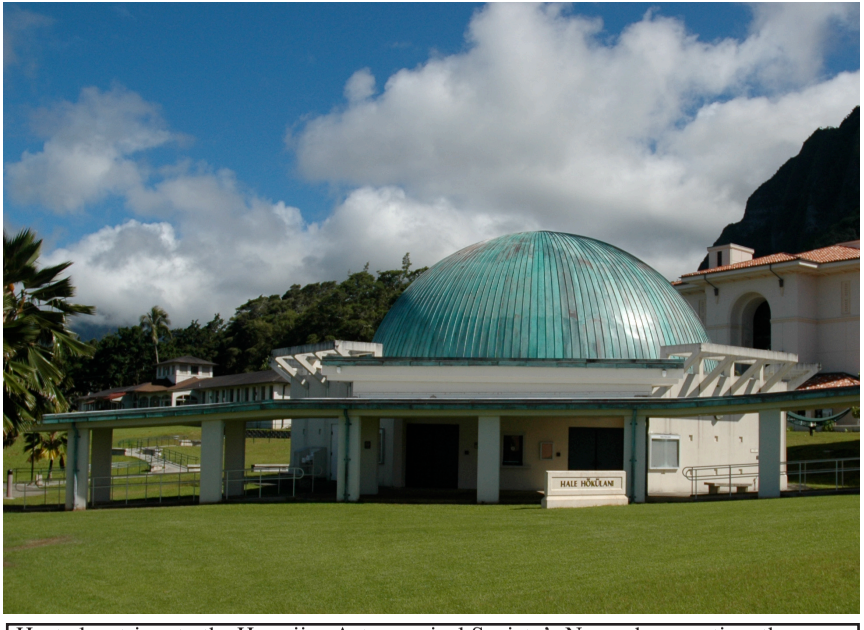

Host planetrium to the Hawaiian Astronomical Society's November meeting, the Imaginarium on the grounds of the Windward Community College is well worth the drive for those on the Leeward side. See article on page 1 on the history and descripton of the facilities.

Image courtesy: ***Joe Ciotti, Windward Community College***