

The Astronews



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www.hawastsoc.org

President's Message

by Chris Peterson

One problem with showing Mars to the public is that, when Mars appears biggest to us at (or near) opposition, it isn't highest in the sky until midnight. By the time it's high overhead in the early evening, it's way past opposition and appears much smaller. The sweet spot for showing Mars to the public is usually several days past opposition when Mars is already above the horizon at sunset and it's still big enough to show some detail when it's high enough in the sky to allow good views. Fortunately, retrograde motion is most rapid near opposition, so Mars rises noticeably earlier each evening then.

This opposition is more challenging than most because opposition occurs when Mars is near aphelion, its farthest point from the Sun. Mars barely exceeds 14 arc seconds this time, so the window of opportunity for viewing surface features is rather short. During the current cycle of oppositions, this is the next to worst, not much better than the next one in 2012. However, Mars is at its best as we say goodbye to Jupiter as it sinks into the sunset sky and anticipate the return of Saturn to early evening visibility. Mars fills that gap quite nicely.

None of this means that we shouldn't try to observe Mars this time, just that we can't miss any chances! The north polar cap is tipped towards us now, so it should present an inviting target. Think how much more we know about Mars than we did one opposition cycle ago. Now as we look at the polar cap, we can imagine the Phoenix lander as the Sun slowly

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Upcoming Events:

- ☆ The next meeting is 7:30PM on **Tues., Feb. 2** at the Bishop Museum Planetarium.
- ☆ Bishop Museum's next planetarium shows with **Barry Peckham** are Friday, **Feb. 5 & 19** at 8:00 p.m.
www.bishopmuseum.org/calendar
- ☆ The next Board Meeting is Sunday, **Jan. 31** at 3:30 p.m. at the POST building at UH.



GUEST SPEAKER ROB LANDIS TO SPEAK AT FEBRUARY CLUB MEETING

* * * * *

We are excited to announce a special guest from NASA, visiting Honolulu on the way to a meeting on the Big Island and stopping in to give a talk at our meeting. Rob Landis is an aerospace engineer who has been involved in a number of exciting missions, such as the Hubble Space Telescope, Cassini-Huygens, the Mars Exploration Rovers (Spirit and Opportunity) and the International Space Station. Landis is fluent in the Russian language and has logged many tours in Russia working alongside Russian Mission Control personnel and Space Station astronauts.

He is currently assigned to the Lunar Surface Systems Project at Johnson Space Center in Houston, Texas. In that position, he and a small team of scientists and engineers are working with the Augustine Committee, which reviews U.S. human spaceflight plans for the White House. This includes near-Earth objects (NEOs) who many in the scientists believe as high-profile, worthy destinations for advancement of space exploration.

Landis will speak on that subject at the February club meeting, Tuesday, Feb. 2. Get there early--the Friends of Institute for Astronomy will be joining us that night for the talk, so we're hoping to have a nice crowd.

Landis has a passion for advancing humanity's presence across the solar system. He began his career in the planetarium field and has also authored several articles on astronomy as well as the history of science and technology. His most recent nonprofessional article appeared in the May 2009 issue of the Griffith Observer (Griffith Observatory publication) entitled, "NEOs Ho! The Asteroid Option." Excerpts from that article is printed on page 3.



Editor



Hawaiian Astronomical Society
P.O. Box 17671
Honolulu, HI 9681-0671

President

Chris Peterson

956-3131

chrisp@higp.hawaii.edu

Vice-President

Barry Peckham

542-8658

barry@liteboxtelescopes.com

Secretary

Gretchen West

737-4742

gwest002@hawaii.rr.com

Treasurer

Jim MacDonald

261-2162

jim.macd@hawaiiantel.net

The **Astronews Editor**

Carolyn Kaichi

551-1030

c.kaichi2001@gmail.com

Board Members at-Large

John Gallagher

683-0118

gallaghej002@hawaii.rr.com

Harry Zisko

262-1947

harryz@pobox.com

HAS Webmaster

Peter Besenbruch

prb@lava.net

School Star Party Coordinator

Forrest Luke

lukef003@hawaii.rr.com

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January's Meeting Minutes will be published in next month's Astronews--this article are excerpts from Rob Landis' 'NEOs Ho!' originally published in Griffith Observer in May 2009.

Mass extinctions are a fact of life on the Earth. The last known extinction event occurred ~65 million years ago and was likely the result of a NEO, about the size of Manhattan, striking the Earth near present-day Yucatan Peninsula. Much in the same way that Shoemaker-Levy 9 pelted Jupiter with a score of cometary fragments in 1994, the resulting Chicxulub Crater may be only one of several impacts dating back to 65 million years ago.

Due to the impact threat they pose, in 1998 NASA accepted the mandate to detect and catalogue 90% of NEOs larger than 1 km. To date [as of 30 December 2007], 5105 NEOs have been discovered. Of that total, there are currently 913 known potentially hazardous asteroids (PHAs). PHAs are defined as those bodies that have a minimum orbit intersection distance of 0.05 AU (~7 million km) from the Earth. The NASA Authorization Act of 2005 directs NASA to detect and characterize NEOs down to 140 meters in size. The number of such smaller asteroids is vastly greater than the number of larger asteroids. This means that the discovery rate will increase dramatically over the next ten years, even if only two new search telescopes begin operations; namely, Pan-STARRS-4 (Panoramic Survey Telescope and Rapid Response System) on Mauna Kea and the Large Synoptic Survey Telescope (LSST) in Chile. By the middle of the next decade NEO experts fully expect that there will be hundreds – if not a thousand or more – of possible new candidate NEOs accessible for a piloted Orion mission.

This will present a target-rich opportunity for the exploration, science, and space operations directorates of NASA to cooperate and mount a piloted Orion test flight to a NEO. So little is understood about the sheer numbers, origin, and characteristics of NEOs, that a manned mission with sample return to even one of these will expand humanity's deep space experience base for future missions to the Moon and Mars. Such a mission will harvest an unimaginable scientific return for the benefit of all mankind. To date, robotic spacecraft have visited only a handful of asteroids; only two of which have explored NEOs. Prior to launching a piloted expedition to a NEO, it will be prudent execute a set of robotic precursor missions to NEOs that would potentially be explored by a human crew.

To date, there have been only two spacecraft missions that have explored NEOs to any extent: NASA's NEAR Shoemaker spacecraft at asteroid 433 Eros in 1999 and the Japanese Space Agency's Hayabusa probe at asteroid 25143 Itokawa in 2005. Both of these robotic missions are considered to be extremely successful and have generated much scientific interest in NEOs. However, even though the scientific community has a better understanding of NEO physical properties and compositions based on the data from these missions, there are still many questions that remain unanswered. For example, data from the remote sensors on both spacecraft have been unable to identify the exact composition and internal structure of each asteroid after operations of several months in orbit and a few landings (one for NEAR Shoemaker and two for Hayabusa). Therefore, even though both missions are considered to have achieved almost all of their scientific goals, they still were limited by the pre-programmed and remotely controlled capabilities of their spacecraft. For example, NEAR Shoemaker was not built for sample return, and Hayabusa's collection mechanism was designed to obtain only two small samples of the asteroid. It is still not clear if Hayabusa managed to obtain a sample of asteroid Itokawa. Subsequently the science results that came from both of these missions, although extremely valuable, are still somewhat limited in terms of determining exactly the compositions and internal structures of these NEOs. ☆

Building a Case Against Ozone

By Patrick Barry

When it comes to notorious greenhouse gases, carbon dioxide is like Al Capone—always in the headlines. Meanwhile, ozone is more like Carlo Gambino—not as famous or as powerful, but still a big player.

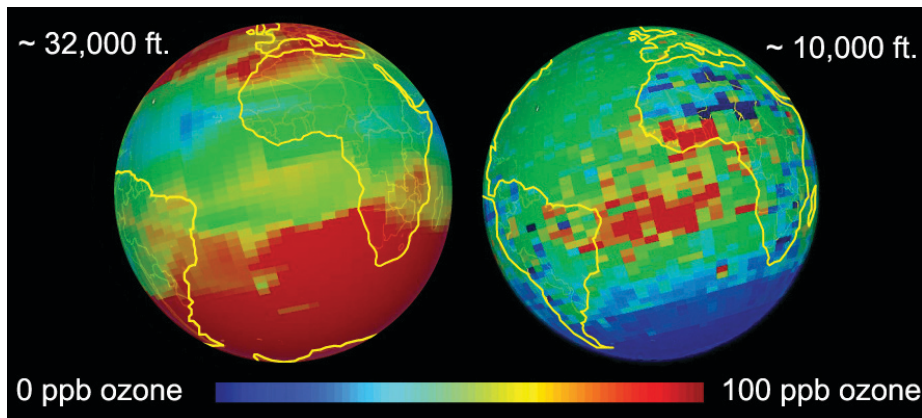
After tracking this lesser-known climate culprit for years, NASA's Tropospheric Emission Spectrometer (TES) has found that ozone is indeed a shifty character. Data from TES show that the amount of ozone—and thus its contribution to the greenhouse effect—varies greatly from place to place and over time.

“Ozone tends to be localized near cities where ozone precursors, such as car exhaust and power plant exhaust, are emitted,” says Kevin Bowman, a senior member of the TES technical staff at the Jet Propulsion Laboratory. But the ozone doesn't necessarily stay in one place. Winds can stretch the ozone into long plumes. “Looking out over the ocean we can see ozone being transported long distances over open water.” Unlike CO₂, ozone is highly reactive. It survives in the atmosphere for only a few hours or a few days before it degrades and effectively disappears. So ozone doesn't have time to spread out evenly in the atmosphere the way that CO₂ does. The amount of ozone in one place depends on where ozone-creating chemicals, such as the nitrogen oxides in car exhaust, are being released and which way the wind blows.

This short lifespan also means that ozone could be easier than CO₂ to knock off.

“If you reduce emissions of things that generate ozone, then you can have a quicker climate effect than you would with CO₂,” Bowman says. “From a policy standpoint, there's been a lot of conversation lately about regulating short-lived species like

(Continued on page 9)



These images are TES ozone plots viewed with Google Earth. Colors map to tropospheric ozone concentrations. The image on the left shows ozone concentrations at an altitude of approximately 32,000 feet, while the one on the right shows ozone at approximately 10,000 feet. The measurements are monthly averages over each grid segment for December 2004

Last month club V.P. Barry Peckham wrote an article about observing during the winter months in Hawaii. This month members Mel and Clare Levin add to that theme....

From our backyard on 12-13-09 from 9:15 to about 11:45 pm Clare and our granddaughter observed some 40-plus Geminids. I only saw about 10 but I was busy assembling our telescope as it was a clear good seeing night.

Using our 35mm and 13mm eyepieces with and without an OIII filter we saw the Christmas tree cluster with surrounding nebulosity--(cone nebula?). We also observed the Rosette Nebula with it's central core of stars, NGC2244. Other observations included the Tau cluster in the big dog and it was excellent with the 13mm--the now famous dog butt double and the following Messiers--41-42-35-36-37-38-44-45-79.

Also observed were the Perseus double cluster and OB association as well as Mars and Jupiter.

In summary it was a great night for us and reiterates Barry's thesis about seasonal miracles.

SO YOU'VE ONLY GOT 45 MINUTES TO OBSERVE!!!!

January 8th from midnight till 12:45 AM was an extremely clear window in Hawaii Kai for observing so Clare made the following observations using her 15x50 Canon image stabilized binocs.

In her nightgown in our front yard--(yes the gate was closed)!

- | *M42-43 including the trapezium |
- | *M46 and 47 in Puppis |
- | *NGC 2244 in Monoceros |
- | *Canopus twinkling and reflecting multi-hued colors |
- | *Mars bright and beautiful |
- | *Algeiba-the lovely double in Leo |
- | *M35 in Gemini |
- | *M44--the Beehive in Cancer |
- | *The Pleiades and the Hyades |
- | *M37-36-38 in Auriga |
- | *M41 in C. Major and of course the now famous DOG BUTT DOUBLE |
- | *The double cluster in Perseus as well as the OB association. |

So if an old lady with lousy eyesight and cataracts can handle that in a flimsy nightie what excuses can you all give for not getting out and doing some first class observations??

Clear Skies, Clare and Mel Levin



Planets Close To the Moon

Times are Hawaii Standard Time

Feb 2, 11h, M 7.5° SSW of Saturn
(129° from sun in morning sky)

Feb 11, 17h, M 2.3° NW of Mercury
(21° from sun in morning sky)

Feb 16, 11h, M 5.4° NNW of Uranus
(27° from sun in evening sky)

Feb 25, 16h, M 5.1° W of Mars
(143° from sun in evening sky)

Venus, Jupiter and Neptune are closer than 15° from the sun when near the moon in February.

Other Events of Interest

Times are Hawaii Standard Time

Feb 2, Groundhog Day, halfway between winter solstice and vernal equinox.

Feb 8, Alpha Centaurid meteors
(Favorable year for this sometimes major shower)

Feb 12, 16h, Moon at apogee - farthest from the Earth this year.










Feb 13, 26:52h, Moon New

Feb 14, 13h, Neptune at conjunction with sun (Passes into morning sky)

Feb 17, 15h, Asteroid 4 Vesta at opposition.

Feb 01, 13h, Jupiter at conjunction with sun (Passes into morning sky)

Feb 28, 06:37h, Moon Full

 Mercury Still visible low in the east before dawn during the first two weeks of Feb.	 Venus Venus is too close to the sun to be viewed in February.	 Mars Reached opposition on Jan. 29 and is still big and bright in the evening sky in February.
 Jupiter Reaches conjunction with sun this month and is lost in the glare of the sun.	 Saturn Rises about 8:30 in mid-month and has a magnitude of +0.7.	 Uranus Low in the SW in the evening sky in the constellation of Aquarius.
 Neptune Reaches conjunction with sun this month and is lost in the glare of the sun	 Dwarf Planet Pluto Reached conjunction with the sun on Dec. 24 and is still too close to the sun for easy viewing.	 Asteroid 4 Vesta Reaches opposition on Feb. 17 at magnitude +6.1. This is the brightest asteroid.

THE HAWAIIAN ASTRONOMICAL SOCIETY

MEMBERSHIP APPLICATION

Date: _____

Name _____

Street or P.O. Box _____

City _____ State _____ Zip _____

Phone _____ (e-mail) _____

Family Members _____

Dues \$20.00 _____

Dues (Student) \$12.00 _____

Additional family members. Each \$2.00 _____

Sky and Telescope Subscription \$32.95 _____

Astronomy Subscription \$34.00 _____

Donation _____





Total _____

Fill out this form and send with your check to:

Hawaiian Astronomical Society

P.O. Box 17671

Honolulu, Hawaii 96817-0671

< February 2010 >						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1 7:30 PM Club Meeting	2	3	4	5 7:00 PM Winter Public Star Party 6:00 PM Club Star Party (D)  Sunset: 6:26 PM	6
7	8	9	10	11	12 6:00 PM Public Star Party(D) Sunset: 6:30 PM	13
14 	15 Washington's Birthday	16	17	18	19 Waikiki Elem Sch SP 6:00 PM Public Star Party(K) 6:00 PM Public Star Party(W) Sunset: 6:33 PM	20
21	22 	23 Milliani Middle Sch SP	24	25	26	27 Sunset: 6:36 PM
28 	1	2	3	4	5	6

Night Sky Network

Astronomy Clubs bringing the wonders of the universe to the public

<http://nightsky.jpl.nasa.gov/>

**NEW LOOK FOR THE
ASTRONEWS CALENDAR!**

 **Check
it
Out!**

☆ Upcoming Star Parties ☆

Club Party-Dillingham	Feb. 6
Public Party- Dillingham	Feb. 13
Kahala/Waikele Party	Feb. 20

(Space Place continued from page 4)
ozone.”

To be clear, Bowman isn’t talking about the famous “ozone layer.” Ozone in this high-altitude layer shields us from harmful ultraviolet light, so protecting that layer is crucial. Bowman is talking about ozone closer to the ground, so-called tropospheric ozone. This “other” ozone at lower altitudes poses health risks for people and acts as a potent greenhouse gas.

TES is helping scientists track the creation and movement of low-altitude ozone over the whole planet each day. “We can see it clearly in our data,” Bowman says. Countries will need this kind of data if they decide to go after the heat-trapping gas. Ozone has been caught red-handed, and TES is giving authorities the hard evidence they need to prosecute the case.

Learn more about TES and its atmospheric science mission at tes.jpl.nasa.gov. The Space Place has a fun “Gummy Greenhouse Gases” activity for kids that will introduce them to the idea of atoms and molecules. Check it out at spaceplace.nasa.gov/en/kids/tes/gumdrops.

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



Upcoming School Star Parties

Fri.	3/19	Waikiki Elementary
Wed.	2/24	Mililani Middle (at Mililani High)
Sun.	3/21	Alvah Scott Elementary (Tentative) Cub Scouts
Tues.	3/23	Mililani Ike Elementary
Wed.	3/24	Kipapa Elementary (Mililani)

***Meteor Log - February 2010** by Mike Morrow*

February is a month of normally weak showers and also has the years lowest sporadic numbers. However fireball-class sporadic meteors may be really neat. Moonlight will mess up the fires ten days of the month.

Monday the 8th, the **Alpha Centaurids**. Radiant 14h00m, -59 deg. Rates for Hawaii are well below 25 meteors an hour. Meteors can be bright, fast, and often trained. The shower has been quite weak the past several years with less than 6 meteors a hour.The Moon will cause few problems with the radiant highest near dawn.

If you are interested in observing meteors contact **Tom Giguere** at 672-6677, or write **Mike Morrow**, P.O. Box 6692, Ocean View, Hawaii 96737

Treasurer's Report

by Jim MacDonald

HAS Financial Report for the month ending as of Jan. 15, 2010

Initial Balance:	\$4,592.05
<i>Receipts:</i>	270.00
Dues Received	270.00
Donations	33.05
Magazine Payment	167.90
Total Income:	\$470.95
<i>Expenses:</i>	
Astronews	166.27
Magazine Subscription	134.95
Postage	1.90
Equipment (address stamp)	17.76
Refreshments	14.07
Total Expenses:	\$334.95
Final Balance	\$4,728.05

We gained three new members this month. They are *Valerie Vares*, *Guy Ballou* and *Ray Balogh*. A special thanks to *Daniel Fischberg* and *David Dellalana* for their donations. Thanks and clear skies to all renewing their membership this month. Don't forget that most members have December as their renewal anniversary date. There are still a few of you out there that need to renew your membership.

-SEE PAGE 7 FOR HARD COPY RENEWAL FORM-

NOTICE:

HAS will publish a complete listing of Club members in the April 2009 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. If you wish to have some or all of your data excluded, please notify the Club Treasurer, Jim MacDonald before 15 March 2010 by sending him an e-mail at jim.macd@hawaiiintel.net or by written notice to the Club's post office box listed on the back page of this newsletter. 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 make this list available to, nor do we sell its contents to anyone for any purpose.

Please respect our members' rights to privacy!



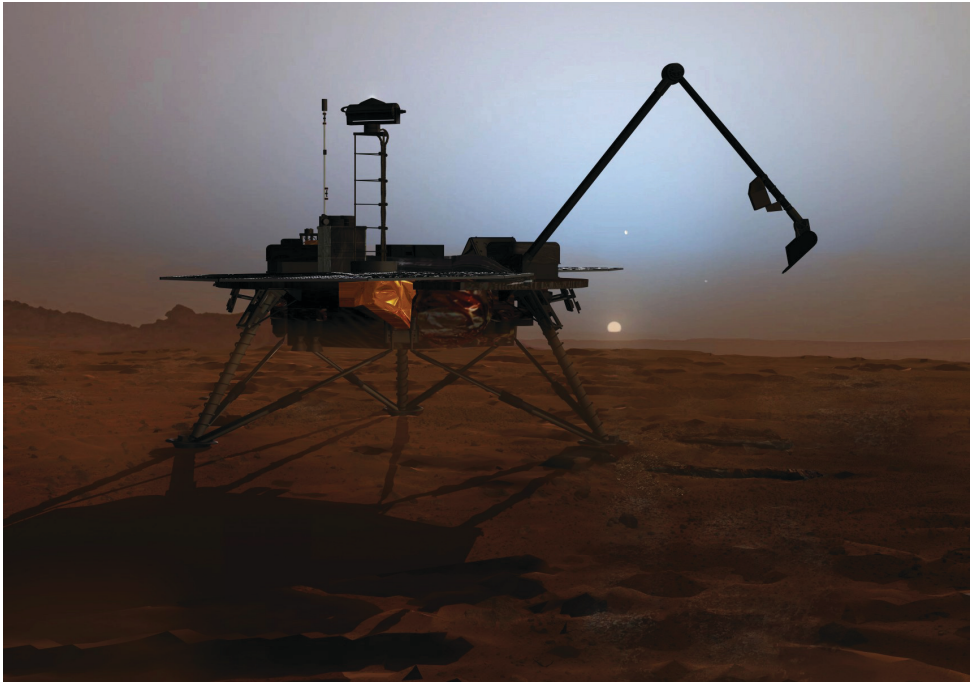
(President continued from page 1)

frees it from its winter-long coating of carbon dioxide frost. Will it spring back to life as the Sun once again falls on its solar panels? Probably not, but we're listening just in case.

Just because the International Year of Astronomy is over, let's not forget about Galileo. January 2010 marked the 400th anniversary of his discovery of the four large moons of Jupiter, and he published "The Starry Messenger" in March of 1610. It is this publication that is the reason we remember him, and not someone else, as the father of telescopic astronomy. Have you ever observed something interesting in the sky? Did you tell anyone about it? If not, maybe you should. It may change how you are remembered!



Chris



Phoenix Twilight Image credit: NASA/JPL-Caltech/University of Arizona

The Phoenix Lander begins to shut down operations as winter sets in. The far northern latitudes on Mars experience no sunlight during winter. This marks the end of the mission because the solar panels can no longer charge the batteries on the lander and the frost covering the region as the atmosphere cools will bury the lander in ice.

This rendition of the Phoenix lander was created by artist Corby Waste for the Jet Propulsion Laboratory. As the Mars program artist, Mr. Waste has created artwork for several Mars missions.

Hawaiian Astronomical Society
P.O. Box 17671
Honolulu, HI 96817-0671



Artist depiction of a manned mission to a near-Earth object (NEO), proposed as an expansion of human exploration into space. See story on page 2 and accompanying article written by guest speaker Rob Landis on page 3.

Artwork courtesy of Dan Durda, FIATAA



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