

Astronomy on Vacation

— Clare and Mel Levin

On our October trip to the mainland there were 2 notable astronomical occurrences.

The first was a visit to the Chabot Space and Science Center in the hills above Oakland. The physical layout and architecture were stunning and the exhibits, especially the one on Mars, were very informative.

The theatre-planetarium has a 70 foot seamless dome and is the most state of the art on the planet with a projection system powered by a Zeiss Universarium star projector. Although there are seats for 240, everyone was excellent with regard to sight and sound.

We viewed 3 color presentations of about 45 minutes—"Search for Life" narrated by Harrison Ford was developed by the Museum of Natural History in collaboration with NASA. Next was "Black Holes" narrated by Liam Neeson. This was a Denver Museum of Nature

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Upcoming Star Parties

Public Party	Dec 30	Kahala/Waikele
Club Party	Jan 13	Dillingham
Public Party	Jan 20	Dillingham
Public Party	Jan 27	Kahala/Waikele
Public Party	Feb 10	Dillingham
Public Party	Feb 17	Dillingham
Public Party	Feb 24	Kahala/Waikele

Upcoming Events:

- The next meeting is at 7:30 p.m. on **Tuesday, Jan. 2nd** at the Bishop Museum.
- Bishop Museum's next planetarium show with **Barry Peckham** is Friday, **Jan. 5th** at 7:00 pm.

President's Message

Another year begins with its known and unknown challenges and delights awaiting us. We can count on the return of Saturn, then Jupiter, to prominence in our early evening skies. Venus will pass scarcely more than a full Moon's width from Saturn at sunset on June 30th. Earth will take most of the year to creep up slowly on Mars until it overtakes it again near Christmas time. Earthlings will take the opportunity to hurl more spacecraft at our ruddy neighbor. We are learning so much about Mars now that at each opposition it seems we are looking at something we hardly knew the last time.

Jupiter will get a brief visit from the New Horizons mission in February as it borrows a little gravitational energy from the giant planet to help it on its way to distant Pluto and beyond. What changes can we see since Galileo sent our last close views in 2003? Venus will do a similar gravitational favor for the Messenger spacecraft in June as it works its way in towards its target, Mercury. The European Venus Express should still be operating then, and so should Cassini, revealing ever more about Saturn and its satellites. Closer to home, Japan and China both plan to send spacecraft to the Moon.

The familiar constellations and deep sky objects will reveal themselves in their usual order as Earth circles the Sun and shields an ever-changing portion of the night sky from its glare. We can expect the usual meteor showers and, probably, a few new comets, but will any of them be spectacular? Will a supernova light up the night (or even day!) sky? Will the Sun send disruptive amounts of energy our way, or just enough to color the polar skies with auroras? What new fundamental knowledge about our universe will scien-

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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

- Jan 6, 09h, M 0.86° NE of Saturn
(142° from sun in morning sky)
Jan 15, 05h, M 5.8° S of Jupiter
(44° from sun in morning sky)
Jan 16, 16h, M 4.5° S of Mars
(26° from sun in morning sky)
Jan 20, 05h, M 2.2° SSE of Neptune
(19° from sun in evening sky)
Jan 20, 08h, M 0.73° SE of Venus
(21° from sun in evening sky)
Jan 21, 19h, M 0.44° WNW of Uranus
(40° from sun in evening sky)










Mercury is closer than 15° from the sun when near the moon in January.

Other Events of Interest

Times are Hawaii Standard Time

- Jan 3, 03:57h, Moon Full
Jan 3, 11h, Earth at perihelion, nearest to sun during 2007 at 0.98326 a.u.
Jan 6, 20h, Mercury at superior conj. with sun (Passes into evening sky.)
Jan 18, 17h, Venus 1.3° SSE of Neptune (20° from sun in evening sky)
Jan 18, 18:00h, Moon New
Jan 29, 03h, Asteroid 20 Massaliaa at Opposition

Planets in January

 Mercury is visible very low in the western sky after sunset during the last week of the month.	 Venus rises rapidly in the evening sky and by month's end will be 20° above the horizon at sunset at Mag.-3.9.	 Mars is beginning to distance itself from the sun in the morning sky as it begins its approach to opposition next December.
 Jupiter is low in the southeastern sky at dawn.	 Saturn reaches opposition early in Feb., so is in the sky most of the night. Best observed in the late evening.	 Uranus can be viewed low in the southwest in the evening sky in Aquarius.
 Neptune rises a little earlier than Uranus and can also be viewed early in the evening in Capricornus.	 Dwarf Planet Pluto is still too close to the sun this month to be viewed.	 Dwarf Planet Ceres is visible in the early evening sky near the 3.3 mag star Skat in Aquarius. Magnitude 9.3.

President Chris Peterson called the December 5, 2006 meeting, of the Hawaiian Astronomical Society, to order at 7:36 p.m. The meeting was held at the Atherton Halau of the Bishop Museum. In attendance were twenty-nine members and two visitors, Cary Johnston and Ken Kurashima.

OLD BUSINESS

Pres. Peterson reviewed current astronomy news items: Chris spoke of an emerging theory the “Galactic Baby Boom,” periods of increased star formation and the variations and productivity of life on Earth. Chris also reviewed a current article, which discussed the Antikythera Mechanism, discovered in 1901. The mechanism is believed to be an ancient mechanical analog computer designed to calculate astronomical positions.

★Hawaii Space Lecture Series- The Hawaii Space Lecture Series has no lecture scheduled for December of 2006, and plans to present its next lecture in January of 2007.

★Insurance - Insurance coverage with the Astronomical League begins in January 2007.

★Star Party Report - We have no school star parties scheduled for the rest 2006.

★Jim Bedient spoke briefly regarding a program for Super Astronomy at the IFA on December 12, 2006. The group “Friends of Hawaii Astronomy,” is sponsoring a panel made up of graduate student and researchers.

★Elections – John Sandor officiated for the annual elections, which took place during the December 2006 general membership meeting. Accepted for election by unanimous vote of the general membership assembled

were:

- ✧President—Chris Peterson
- ✧Vice-President—Barry Peckham
- ✧Treasurer—Jim MacDonald
- ✧Secretary—Gretchen West
- ✧Astronews Editor—Paul Lawler

Three people, John Gallagher, Susan Girard, and Bob Kesler, ran for the two At-Large positions on the HAS Board of Directors. Election for the two positions was accomplished by secret ballot. Elected were:

- ✧John Gallagher
- ✧Susan Girard

★Bishop Museum – The Planetarium at the Bishop Museum has a new display in the rotunda. The NOAA Global Sphere, one of only six across the United States, is a great teaching and learning tool. There are two different presentations given in the rotunda, at 9:00 a.m. and 3:00 p.m.

★Carolyn Kaichi, Planetarium Director for the Bishop Museum, thanked all the members who were able to participate in the activities on the lawn of the Bishop Museum for the recent Transit of Mercury. Their help contributed to make the event a great success.

★NASA Night Sky Network Update - At-Large Member, John Gallagher spoke briefly about the November 16, 2006 Nite-Sky Network teleconference. This month’s lecturer will be Dr. David Koch discussed the Kepler Mission.

★Presentation – We viewed a NASA video from the Night Sky Network that describes and differentiated star type and color. We also viewed a presentation, put together by Paul Lawler, on the history of minor plan-

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The meteoric year of 2007 is one of two unequal parts. Mostly moonlit shower maxima dominate till the end of July, followed by mostly moonless peaks till late December. Of the three big showers, the Perseids and Geminids are the three best-placed. The January Quadrantids fight against full Moon.

Thursday the 4th, **the Quadrantids**. Radiant 15h20m +40 degrees. The maximum is forecast for about 2:30 PM local time which means the Sun will be too bright to see much. As mentioned above the full Moon will not help either. You might try to look or listen to WWVH on the 15 MHz. frequency and you might hear a few beeps from the meteors.

That is about it for January.

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

Vacation (Continued from page 1)

and Science production with grants from NASA and the National Science Foundation. The last was “Immersive Space”—a fantasy fly through the cosmos to the edge of the known universe. It was narrated live by a staff member who answered questions at the end. It was by far the best of the three—but they were all informative and entertaining. We also spent time with a class of about 15 people polishing mirrors for a home telescope project. They meet every Friday night and some have been working on their mirrors for months—tedious work.

The only negative aspect of the night was the weather—cloudy with fog. So they cancelled the telescope viewing. Thus we did not see :Rachael, the 20" refractor or its companion “Leah” an 8" refractor which was the original 1883 instrument donated by founder Anthony Chabot. They also have a new 36" reflector named Nellie!

The other astronomical event was observing the night sky from our son’s yard in the hills of rural Oregon. It sits on a hilltop surrounded by forest land with a 360 degree view of the sky with no significant light pollution for 15 miles. The sky was brilliant—comparable to Dillingham on its best night—but cold. Some evenings were too cold for us to linger, but toward the end of our stay there were three warmer nights with clear, blazing skies. We had a good time with 16x70 binoculars and were able to identify a rash of M’s and NGC’s. As a bonus about 4 am mighty Orion and his blazing entourage Appeared. For a time we were puzzled by a bright triangle in the east but decided it was Saturn–Regulus–Algieba. So this was altogether astronomical trip to remember.

President (Continued from page 2)

tists wring from the photons they collect from our growing number of mechanical eyes? Who knows what we can experience and learn if we keep our eyes and our minds on the sky in 2007?

Chris

2007 Meeting & Star Party Dates

Club Meeting	Dillingham Public	Dillingham Club Only	Kahala/Waialeale
Jan 2	Jan 20	Jan 13	Jan 27
Feb 6	Feb 17	Feb 10	Feb 24
Mar 6	Mar 10	Mar 17	Mar 24
Apr 3	Apr 7	Apr 14	Apr 21*
May 1	May 5	May 12	May 19
Jun 5	Jun 16	Jun 9	Jun 23
Jul 3	Jul 14	Jul 7	Jul 21
Aug 7	Aug 4	Aug 11	Aug 18
Sep 4	Sep 15	Sep 8	Sep 22
Oct 2	Oct 13	Oct 6	Oct 20
Nov 6	Nov 10	Nov 3	Nov 17
Dec 4	Dec 1	Dec 8	Dec 15
Jan 8 '08	Jan 12 '08	Jan 5 '08	Jan 19 '08

*Astronomy Day

There are two kinds of light—the glow that illuminates, and the glare that obscures.

—James Thurber

Join the Friends of the Institute for Astronomy (IfA)

As a “Friend” you can be directly involved in the mission of the University of Hawaii’s Institute for Astronomy. You will be invited to meet with IfA and visiting scientists, attend star parties and other activities. You will also receive quarterly newsletters and invitations to special events at the IfA. For more information and an application form go to www.ifa.hawaii.edu/friends

Monday January 22nd, Art Auditorium, UH Manoa Campus*

Killer Asteroids - and what we can do about them

Panel discussion featuring NASA Astronaut Ed Lu, and IfA astronomers David Tholen, Robert Jedicke, and Nick Kaiser.). Tholen and Jedicke will be talking about asteroids and asteroid disasters, Nick Kaiser will be talking about the newly-built PanSTARRS survey telescope facility on Haleakala, and Ed Lu (who was a solar physicist at the IfA for several years) will talk about his recently published ideas for a “gravity tractor” that can alter the orbit of a dangerous asteroid.

For more information see:

http://www.ifa.hawaii.edu/specialevents/killer_asteroids.htm

* There will be an identical presentation at UH-Hilo on Friday January 19th



Space Weather for Air Travelers

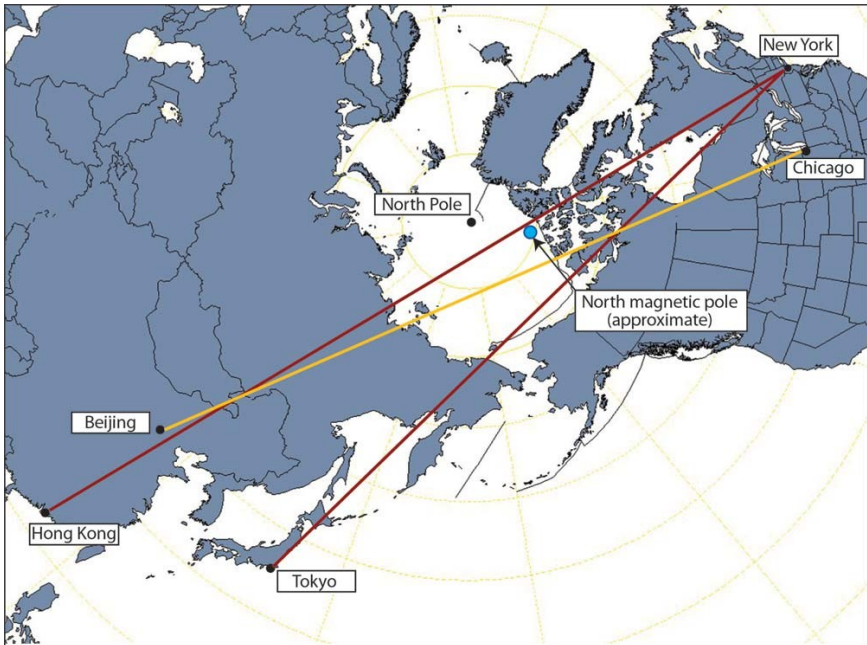
by Dr. Tony Phillips

At a time when much of the airline industry is struggling, one type of air travel is doing remarkably well: polar flights. In 1999, United Airlines made just twelve trips over the Arctic. By 2005, the number of flights had grown to 1,402. Other airlines report similar growth.

The reason for the increase is commerce. Business is booming along Asia's Pacific Rim, and business travel is booming with it. On our spherical Earth, the shortest distance from Chicago to Beijing or New York

"Solar storms have a big effect on polar regions of our planet," explains Steve Hill of NOAA's Space Weather Prediction Center in Boulder, Colorado. Everyone knows about the Northern Lights, but there's more to it than that: "When airplanes fly over the poles during solar storms, they can experience radio blackouts, navigation errors and computer reboots—all caused by space radiation."

In 2005, United Airlines reported dozens of flights diverted from polar routes by nasty space weather. Delays



The shortest airline routes from the Eastern U.S. to popular destinations in Asia go very near the magnetic North Pole, where space weather is of greatest concern.

to Tokyo is over the North Pole. Suddenly, business travelers are spending a lot of time in the Arctic.

With these new routes, however, comes a new concern: space weather.

ranged from 8 minutes to nearly 4 hours, and each unplanned detour burned expensive fuel. Money isn't the only concern: Pilots and flight

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attendants who fly too often over the poles could absorb more radiation than is healthy. “This is an area of active research—figuring out how much exposure is safe for flight crews,” says Hill. “Clearly, less is better.”

To help airlines avoid bad space weather, NOAA has begun equipping its GOES weather satellites with improved instruments to monitor the Sun. Recent additions to the fleet, GOES 12 and 13, carry X-ray telescopes that take spectacular pictures of sunspots, solar flares, and coronal holes spewing streams of solar wind in our direction. Other GOES sensors detect solar protons swarming around our planet, raising alarms when radiation levels become dangerous.

“Our next-generation satellite will be even better,” says Hill. Slated for launch in 2014, GOES-R will be able to photograph the Sun through several different X-ray and ultra-violet

filters. Each filter reveals a somewhat different layer of the Sun’s explosive atmosphere—a boon to forecasters.

Also, advanced sensors will alert ground controllers to a variety of dangerous particles near Earth, including solar protons, heavy ions and galactic cosmic rays.

“GOES-R should substantially improve our space weather forecasts,” says Hill. That means friendlier skies on your future trips to Tokyo.

For the latest space weather report, visit the website of the Space Weather Prediction Center at <http://www.sec.noaa.gov/>. For more about the GOES-R series spacecraft, see http://goespoes.gsfc.nasa.gov/goes/spacecraft/r_spacecraft.html. For help in explaining geostationary orbits to kids—or anyone else—visit The Space Place at http://spaceplace.nasa.gov/en/kids/goes/goes_poes_orbits.shtml.

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 4)*

ets, planetoids and asteroids.

★Photography at the eyepiece -Vice President Barry Peckham gave some pointers about digital photography that any person can accomplish at the eyepiece. Barry displayed lunar photographs he had taken at our latest Kahala star party. Try it. you’ll like it!

★The meeting was adjourned at 9:07 p.m. Refreshments were served.

★After the Meeting – Joanne Bogan set up and ran the new display and program in the Planetarium rotunda on Global Warming for interested HAS member.

Respectfully Submitted,
Gretchen West

Bumper Stickers - Club bumper stickers available for purchase from Jim MacDonald at the club meetings. They are priced at only \$3.00 per bumper sticker.

THE HAWAIIAN ASTRONOMICAL SOCIETY
MEMBERSHIP APPLICATION
2006/2007

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Astronomy Subscription \$34.00 _____

Donation _____

Total _____

Fill out this form and send with your check to:

Hawaiian Astronomical Society

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HAS Financial Report as of December 15, 2006

Initial Balance: \$4,703.69

Receipts:

Donations	27.05
Dues Received.....	345.00
S&T Payments.....	131.80
Astronomy Payments.....	68.00
T-Shirt Sales	60.00
Bumper Sticker Sales	9.00

Total Income:..... **\$640.85**

Expenses:

Astronews.....	243.40
Magazine Subscriptions/Insurance	757.60
PO Box Rent.....	74.00
Postage	4.05
Refund	32.95
Refreshments	8.01

Total Expenses: **\$893.95**

Ending Balance: **\$4,703.69**

Don't forget, year-end membership renewals are now due. A form has been provided on the facing page. This month the club welcomes two new members. They are **Tim Kurashima** and **Carey Johnson**. A special thanks to Gary Shimazu and Robert Humphreys for their donations. A thank you is also in order to all renewing their membership this month. Clear skies to everyone!



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The Analemma and the Temple of Olympian Zeus *Credit & Copyright: [Anthony Aviomantis](#)*