

Taking Back the Sky

Editor

The traffic was “unreal” and we didn’t reach the Dillingham gate until after 7:15. As I passed the polo field it started to sprinkle. I thought to myself, “Why did you just sit in an hour and a half of traffic, you numbskull.” The sky was cloudy and the ground was wet.

Things got off to a slightly rocky start as Barry discovered one of his mirror mounts had come loose, which took a few minutes to fix, and some nitwit observer (who shall remain nameless) tripped over his eyepiece case sending filters and fittings flying. Fortunately Barry and Jim MacDonald were on hand to help me (err...I mean that clumsy fellow) pick things up.

Observing began in earnest as the clouds rolled back (eerily in the opposite direction from the way they usually

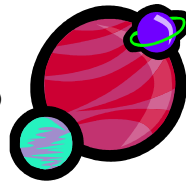
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Upcoming Star Parties

Club Party	Jan 17	Dillingham
Public Party	Jan 24	Dillingham
Public Party	Jan 31	Kahala/Waikele
Club Party	Feb 14	Dillingham
Public Party	Feb 21	Dillingham
Public Party	Feb 28	Kahala/Waikele



Upcoming Events:

- The next meeting is at 7:30 p.m. on Jan. 6th at the Bishop Museum.
- **Sam Rhoads** next Planetarium show on Mon. Jan. 5th.

President's Message

The year ahead will be filled with many astronomy-related events. Mars will be visited by several spacecraft. Although Japanese scientists have given up all *nozomi* of saving the mission of their Nozomi spacecraft (*nozomi* is the Japanese word for *hope*), the European Mars Express orbiter and Beagle 2 lander should have arrived by the time most people read this. Twin U.S. Mars Exploration Rovers are scheduled to land on opposite sides of the red planet in January. Of all the Mars missions that have been attempted so far, about two of every three have failed. We can only wait and *nozomi* for better luck this year.

The Stardust mission reaches comet Wild 2 on January 2nd, but the samples it collects there won't return to Earth until 2006. These will be the first samples collected from a comet and returned to Earth.

The Cassini mission will arrive at Saturn in July. The Huygens probe, built by the European Space Agency, will be released from the main spacecraft in December 2004 for a January 2005 landing on Titan, Saturn's largest moon and the only one with a substantial atmosphere. The surface of Titan is one of the last unseen surfaces among the larger solar system bodies. The probe should survive a landing onto either a solid or liquid surface and transmit images and other data.

A rare transit of Venus across the face of the Sun will occur on June 8, but it won't be visible from Hawaii. You can use that as an excuse to travel halfway around the world, or just wait until June 6, 2012, when Hawaii will be well placed for the last transit of Venus until 2117.

We start out the year with Venus, Mars, Jupiter, Saturn and Uranus all in the evening sky. Jupiter and Saturn will put on

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The Astronomer 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.

Observer's Notebook - January, 2004

Planets Close to the Moon

Times are Hawaii Standard Time

- Jan 6, 14h, M 4.6° N of Saturn
(172° from sun in midnight sky)
- Jan 12, 04h, M 3.1° NNE of Jupiter
(123° from sun in morning sky)
- Jan 19, 17h, M 4.7° S of Mercury
(24° from sun in morning sky)
- Jan 23, 14h, M 4.1° SSE of Uranus
(28° from sun in evening sky)
- Jan 24, 09h, M 3.3° SSE of Venus
(38° from sun in evening sky)
- Jan 27, 19h, M 2.3° SSE of Mars
(78° from sun in evening sky)

Neptune is closer than 15° from the sun when near the moon in Jan.

Other Events of Interest

Times are Hawaii Standard Time

- Jan 2, Stardust space probe to fly past Comet 81P Wild 2.
- Jan 4, 08h, Earth at perihelion, nearest to sun.
- Jan 7, 05:41h, Full Moon
- Jan 9, 02h, Asteroid 1 Ceres at opposition.
- Jan 12, 11h, Asteroid 6 Hebe at opposition.
- Jan 14, 21h, Venus 0.87° SSE of Uranus
(36° from sun in evening sky)
- Jan 16, 23h, Mercury at Greatest Elongation
(23.9° West of the sun in morning sky)
- Jan 21, 11:07h, New Moon
- Jan 31, 24h, Neptune at conjunction with Sun
(Passes into morning sky.)

The Planets in January

♀ Mercury	♀ Venus	♂ Mars
Mercury is visible in mid-month (Jan 10-24), about 45 minutes before sunrise in the east.	Venus is very bright in the evening sky, setting 2 to 3 hours after sunset. Mag -4.0.	Mars is in the southwest in the evening, much dimmer than it was in Aug, but still mag +0.5.
♃ Jupiter	♄ Saturn	♅ Uranus
Jupiter rises by about 10 pm and is the brightest planet for the rest of the night.	Saturn is visible all month, giving the best views or the year.	Uranus is low in the western sky after sunset in Aquarius. Mag +5.7
♆ Neptune	♇ Pluto	
Neptune is too close to the sun to view in Jan, reaching conjunction on January 31.	Pluto was at conjunction last month and is still too close to the sun to be viewed..	

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 a good show for much of the year. Of course, there will be the usual assortment of meteor showers and new or returning comets.

Some events in astronomy are

quite predictable. Others come as a surprise. One thing is certain: If you don't look, you won't see any of them. Keep looking up!

Chris

Meeting Minutes

H.A.S. Secretary

The December 4, 2003 meeting was called to order by President Chris Peterson at 7:35 p.m. in the Atherton Halau, Bishop Museum with thirty members in attendance.

Elections:

The following slate of members ran for offices of Board of Directors. Christine Trusty read the slate of nominees and conducted the elections. The slate was voted upon and the following were elected as HAS board members for 2004:

President - Chris Peterson
Vice President - Barry Peckham
Treasurer - Jim MacDonald
Secretary - Gretchen West
Astronews Editor - Paul Lawler
At-Large Members (2)
- John Gallagher
- Nick Bradley

Old Business:

Bishop Museum Telescope refurbishment was discussed.

If you are contacted for a school star party, please have the school contact Forrest by phone at 623-9830 or via e-mail at <lukef003@hawaii.rr.com>.

As a reminder, upcoming scheduled school star parties are:

27 Feb 2004 Pearl Harbor Elementary
12 Mar 2004 Niu Valley Middle School
23 Apr 2004 Lanakila Elementary
27 Apr 2004 Ala Wai Elementary

Memberships, Renewals and Dues:

Treasurer Jim MacDonald suggests that every member check the address label of their Astronews.

New Business:

Changes at Bishop Museum: Mike

Shannahan has recently been appointed the Education Director for the Bishop Museum. Taking his place as Planetarium Director is Carolyn Kaichi. Joanne Bogan, HAS member and former club secretary, has recently become a full time planetarium presenter.

Upcoming events at Bishop Museum:

January 3, 2004 has been slated as a Mars Lander early evening encounter. Interested members will find activities on the second floor of the Castle building. While later in the year, Bishop Museum will present activities related to the Cassini Project.

Great Moments of 2003:

V.Pres. Barry Peckham lead a members discussion of the high points of members viewing experiences for the past year. Experiences ranged from Mel and Claire Levins' trek "down under" and their views of the southern constellations through a 25 Obsession, to Mike Shannahan recalling the awesome experience for those in attendance during Mars Madness back in August. He wishes to extend another "thank You!" to everyone who helped out that evening.

Any club member who would like a kilolani.net e-mail address can contact Paul Lawler <stargazer@kilolani.net>.

The meeting adjourned at 8:58 pm. for refreshments, followed by a tour of the night sky in the planetarium.

Respectfully submitted,
Gretchen West, HAS Secretary

Fourteen billion years ago, just after the Big Bang, the universe was an expanding fireball, white hot and nearly uniform. All of space was filled with elementary particles and radiation. “Soupy” is how some cosmologists describe it.

Today the universe is completely different. It's still expanding—even accelerating—but there the resemblance ends. The universe we live in now is “lumpy.” Great cold voids are sprinkled with glowing galaxies. In galaxies, there are stars. Around stars, there are planets. On one planet, at least, there is life.

How we got from there to here is a mystery.

Finding out is the goal the Galaxy Evolution Explorer, “GALEX” for short, a small NASA spacecraft launched into Earth orbit April 28, 2003. GALEX carries an ultraviolet (UV) telescope for studying galaxies as far away as 10 billion light-years.

“GALEX is a time machine,” says astronomer Peter Friedman of Caltech. Because light takes time to travel from place to place, pictures of distant galaxies reveal them as they were in the past. “GALEX is investigating the evolution of galaxies over 80% of the history of our universe.”

The Hubble Space Telescope can see faraway galaxies, too, but GALEX has an advantage: While Hubble looks

in great detail at very small regions of the sky, GALEX is surveying the entire sky, cataloging millions of galaxies during its 2-year mission.

GALEX is a UV mission for a reason. Friedman explains: “UV radiation is a telltale sign of star birth.” Stars are born when knots of gas condense in interstellar clouds. The ones we see best are the big ones—massive stars that burn hot and emit

lots of UV radiation.

“These stars are short-lived, so they trace recent star formation.”

Understanding star formation is crucial to studies of galaxy evolution. When galaxies collide, star formation surges. When galax-

ies run out of interstellar gas, star formation wanes. In galaxies like the Milky Way, spiral arms are outlined by star-forming clouds. The shapes of galaxies, their history and fate—they're all connected by star formation.

Even life hinges on star formation, because stars make heavy elements for planets and organic molecules.

“Our measurements of UV radiation will tell us both the rate at which stars are forming in galaxies and the distances of the galaxies,” says Friedman.

How did we get here? GALEX will show the way.

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

HAS Financial Report as of December 15, 2003

Initial Balance:	\$5,792.99
Receipts:	
Astronomy Payment	319.00
Donation	62.00
Dues Received	437.00
S&T Payment	299.55
T-Shirt Deposit	50.00
Total Income:	\$1,167.55
Expenses:	
Astronews & postage	168.85
Magazine Subscriptions	355.41
Tape, Refreshments, P.O. Box	95.64
Total Expenses:	\$620.80
Final Balance:	\$6339.74

During the month we had no new members join the club. Many thanks those renewing their memberships, and especially to **Susan Girard, Alexander Andrade, Gary Shimazu, and Warren Arakaki** for their generous donations. Clear skies to all!

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move at Dillingham), and with the exception of a few passing puffs, left the sky virtually unobstructed in all four directions. I soon forgot the aggravation of the drive from town, although as I looked at the positions of the constellations in the sky with Orion high in the southeast and M31 already past the zenith, I couldn't help feeling that we were robbed of the Fall sky this year.

The seeing was actually wonderful, and the dew point so low that the air (and my observing aids) remained relatively dry. Saturn had lots of colored bands, and I took it up to 500x (hey, it doesn't cost any more) without it falling apart. My favorite galaxy

(NGC 253) was well placed for viewing high in the southwest, and showed lots of detail at high power—dust lanes and a “clumpy” center.

Jim had a wide field eyepiece which showed a wonderful view of M31, M32 and NGC 205 (a.k.a. M110) together in the same field. Barry rose to a challenge by quickly nailing NGC 2419, the most distant globular cluster associated with the Milky Way galaxy. I also got a start on my Herschel 400 objects, beginning with the “ghostly” NGC 891.

About 10:00 the wind picked up, the clouds started rolling in and a few drops were felt so with a quick farewell look at Saturn, we packed up and were out by 10:20.

Star of the Month: Sigma Orionis

by Marc Ricard

New Years may be a time to welcome in the new, but it's also a time to reflect on the past. A late friend of mine, Doug Middleton first showed me the multiple star Sigma Orionis back in November of 1993. It was a night where the sky transparency was rather poor. I wasn't having much success locating the low surface brightness galaxy NGC 255 and Doug suggested I take a look through his scope.

Expecting to see another of the double stars that Doug liked to observe I was pleasantly surprised to see a triple instead. However, when I looked in his finder I was astounded to see that this little gem was sitting just below Orion's belt.

If you've seen Orion before than you've surely seen 4th magnitude Sigma Orionis hovering just below Alnitak the easternmost of the belt stars (see finder chart). Although I only observed three components that night this multiple star system is comprised of five stars in all.

Sigma's main component is actually two stars located only 90 astronomical units (A.U.) from each other. With a separation of only 0.25 arc seconds these two are not easily split in amateur telescopes. Both stars are huge and have a combined mass of

nearly 32 suns.

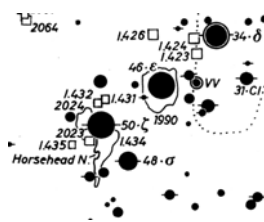
This high mass coupled with their close proximity to each other enables the two stars to orbit each other in only 170 years. To put things in perspective Pluto is only 39 A.U. away and takes over 247 years to complete one orbit. Their high mass places them in the O and B class respectively.

These stellar powerhouses each generate over 30,000 times more radiation than the sun. This excess radiation in turn lights up the nearby gas cloud IC 434 where one finds the Horsehead Nebula.

A little over 11 arc seconds away with a position angle (P.A.) of 238 degrees lies the faintest member of the system the 10th magnitude C component. The 7.5 mag. D star has a P.A. of 84 degrees and lies nearly 13 arc seconds away. With a separation of over 42 arc seconds the 6th magnitude E component can be glimpsed in a pair of binoculars. According to Burham this star has an 8th mag. companion of it's own a little over 30 arc seconds away at P.A. 230.

As you gaze up at the night sky in 2004 take a few minutes to share the view with a friend. They may end up treasuring the experience for a long time.

Happy New Year!



Galaxies (Continued from page 5)

Find out more about GALEX at www.galex.caltech.edu.

For children, visit The Space Place at spaceplace.nasa.gov/

[galex_make1.htm](#) and make a beautiful galactic mobile while learning about some of the different shapes galaxies can take.

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The Aurora Borealis from the editor's sister's back yard in Vermont