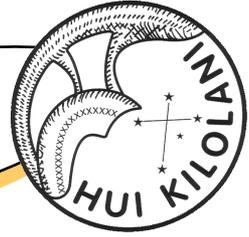


The Astronews



Volume 56, Issue 8

August 2008

www.hawastsoc.org

President's Message

by Chris Peterson

As the Sun moves back to the South of us, it's a good time to reflect on how this most important object in our sky appears to move. As I write this, Lahaina Noon, the moment when the Sun is directly overhead, has just occurred for Oahu. It takes only about two weeks for Lahaina Noon to sweep down from Kauai through the Big Island. (The term, from Hawaiian words meaning "cruel Sun," was coined in a contest run by our own Bishop Museum in 1989.)

As most readers of the Astronews know, the Sun passes overhead at the Tropic of Cancer on the summer solstice and at the Tropic of Capricorn on the winter solstice. What you may not be aware of, though, is that these locations are not fixed but move slowly over time. In fact, even the names are rather outdated by now.

These circles of latitude, as well as the Arctic and Antarctic Circles, result from the tilt of

(Continued on page 2)

Upcoming Star Parties

Club Party	Jul 26	Dillingham
Public Party	Aug 2	Dillingham
Public Party	Aug 9	Kahala/Waikele
Public Party	Aug 23	Dillingham
Club Party	Aug 30	Dillingham
Public Party	Sep 6	Kahala/Waikele

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Upcoming Events:

- The next meeting is at 7:30 p.m. on **Tuesday, Aug 5th** at the Bishop Museum.
- Bishop Museum's next planetarium show with **Barry Peckham** is Friday, **Aug 1st** at 7:00 p.m. www.bishopmuseum.org/calendar
- The next Board Meeting is Sunday **Aug 3rd** at 3:30 p.m. at the POST building at UH.

President's Message (cont.)

(Continued from page 1)

Earth's axis with respect to its orbit around the Sun. It's not necessary to know that, though, to recognize that the Sun stops moving north and starts moving south at the same place and time each year, so this concept is quite old.

Now we know the cause of the phenomenon and also understand that the tilt of Earth's axis, or its "obliquity," varies on many time scales. The main long-term cycle lasts 41,000 years and varies the tilt between 22.5° and 24.5°. On average, this is now causing the Tropic circles to move toward the equator by about 15 meters per year. However, an 18.7-year period of nutation, caused principally by the tides generated by the Sun and Moon, causes a range of motion of 300 meters over that period, and there are other smaller variations as well.

These subtle changes weren't noticed when the tropics were named, and neither was the nearly 26,000 year period of precession as the Earth's spin axis traces a circle on the sky. When the Tropic of Cancer was named, the Sun was in Cancer at the summer solstice. Astrologers of today still use a system that became fixed when the Sun entered Gemini on the solstice, but today it occurs when the Sun is (just barely) in Taurus. Most people who dabble in astrology don't know this, so next time you're with one when the Sun reaches the "Tropic of Taurus," point out Castor and Pollux in the sunset sky. You might get an interesting reaction.

Chris



Hawaiian Astronomical Society

P.O. Box 17671
Honolulu, Hawaii 96817

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

Carey Johnson

216-1410

quarkcsj@hotmail.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

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 16th of each month. We are not responsible for unsolicited artwork.

HAWAIIAN ASTRONOMICAL SOCIETY
GENERAL MEMBERSHIP MEETING
July 1, 2008

President Chris Peterson called the July 1, 2008 meeting of the Hawaiian Astronomical Society to order at 7:31 p.m. The meeting was held at the Atherton Halau of the Bishop Museum. In attendance were twenty-four members and one visitor.

Hawaii Space Lecture Series - The next Hawaii Space Lecture Series will be on Tuesday July 22nd, 2008. Dr. B. Ray Hawke, and Dr. Chris Peterson, both of the Hawaii Institute of Geophysics and Planetology, University of Hawaii will speak. The title of the lecture is "Fly Over the Moon with Kaguya." The lecture will begin at 7:30 pm in the NASA Pacific Regional Planetary Data Center, room 544, on the fifth floor of the P.O.S.T. Building at the University of Hawaii at Manoa. For further information you can contact NASA PRPDC at 808-056-3132 or on the Web go to <http://www.higp.hawaii.edu/prpdc>

Phoenix Mission: President Chris Peterson reviewed for us the purpose for and processing techniques of the Phoenix Lander. The pursuit of evidence for water ice in the northern regions of Mars is of central importance. A heat analyzer will evaluate volatile compounds in Martian soil while a wet chemistry lab will test for factors such as pH and salinity. Chris reviewed current images from the lander. He also explained the physical change of a substance from a solid directly to a gas or the sublimation of water ice versus that of carbon dioxide. Chris also discussed the revival of an earlier hypothesis regarding the origins of the smooth northern plains of Mars. An impact by a giant object impacting Mars some 3.9 million years ago may have cause the smooth plains which are so different from the more southern rocky highlands.

Anniversaries - June 30th marked the fourth anniversary of the Cassini Mission. A new two-year mission, the Cassini Equinox Mission will image the Southern Hemisphere of Saturn. June 30th, 2008 is also the 100th anniversary of the Tunguska Event, which occurred over the skies of Siberia. It has been theorized that a 50km stony meteorite exploded above the ground that day, devastating the surrounding forests and wildlife.

Aloha to Bishop Museum Friends - The Hawaiian Astronomical Society would like to extend our warmest aloha to Carolyn Kaichi who is leaving the Bishop Museum staff due to employee layoffs. We have enjoyed working with Carolyn on a variety of projects and know that wherever she may go, our best wishes go with her. We welcome a renewed association with Mike Shannahan, also of the Bishop Museum, who will be assuming the responsibilities with the museum's Planetarium.

(Continued on page 4)

School Star Party Report - Forrest Luke reports that we do not have any scheduled schools star parties until September.

Visitors: President Chris Peterson greeted one visitor, Tom Bone, to the meeting this month. We hope to see Tom at some of our upcoming star parties and help him become more familiar with telescopes and the night sky.

N.A.S.A. Night-Sky Network - A recent teleconference reviewed the upcoming Shuttle mission to rehabilitate the Hubble Space Telescope. Chris Peterson presented a presentation reviewing the service mission that will update the wide field cameras and improve the HST sensitivity through the use of new spectrographs. The telescope's thermal insulation will be replaced as well. Night-Sky Network coordinator and At-Large Board member, John Gallagher presented a short overview of a second teleconference regarding the upcoming August 1st solar eclipse. NASA scientists will be positioning themselves in China for the event. John reacquainted members with the sizes of umbra and penumbra as they move across the Earth's surface.

Photo Op - Steve Chun displayed his most recent image of the Moon which he has had framed.

Upcoming Kauai Trip - Vice President Barry Peckham informed members of a September 27, 2008 trip to Kauai which some of the amateur astronomers will be undertaking. The trip is not a club event. It is recommended that plans and reservations be made as soon as possible. If anyone interested in going is asked to coordinate with Barry.

Book Review - Barry Peckham reviewed a Time/Life book on "Advanced Star Watching." Barry pointed out that anyone who chooses to buy books on astronomy really needs to have the opportunity to review the book up close and personal. The Time/Life book, despite its title, had little in it to enhance the abilities of the more advanced star watcher. So, buyers beware!!!

The meeting was adjourned at 8:53 p.m. and refreshments were served.

Respectfully Submitted,
Gretchen West, Secretary, H.A.S.

Did you know?

Adopted by HAS on July 6, 2004. No laser in excess of 5 mw output shall be used by any person at any event sponsored by HAS. This restriction also applies to HAS members participating in events sponsored by other organizations such as schools, scouting groups, churches, etc which include HAS as a participating organization.

Death of a Supergiant

By all outward appearances, the red supergiant appeared normal. But below the surface, hidden from probing eyes, its core had already collapsed into an ultra-dense neutron star, sending a shock wave racing outward from the star's center at around 50 million kilometers per hour.

The shock wave superheated the plasma in its path to almost a million degrees Kelvin, causing the star to emit high-energy ultraviolet (UV) radiation. About six hours later, the shock wave reached the star's surface, causing it to explode in a Type IIP supernova named SNLS-04D2dc.

Long before the explosion's visible light was detected by telescopes on Earth, NASA's Galaxy Evolution Explorer (GALEX) space telescope captured the earlier pulse of UV light — scientists' first glimpse of a star entering its death throes.

"This UV light has traveled through the star at the moment of its death but before it was blown apart," explains Kevin Schawinski, the University of Oxford astrophysicist who led the observation. "So this light encodes some information about the state of the star the moment it died."

And that's exactly why astronomers are so excited. Observing the beautiful nebula left behind by a supernova doesn't reveal much about what the star was like before it exploded; most of the evidence has been obliterated. Information encoded in these UV "pre-flashes" could offer scientists an unprecedented window into the in-nards of stars on the verge of exploding.

In this case, Schawinski and his colleagues calculated that just before its death, the star was 500 to 1000 times larger in diameter than our sun, confirming that the star was in fact a red supergiant. "We've been able to tell you the size of a star that died in a galaxy several billion light-years away," Schawinski marvels.

"GALEX has played a very important role in actually seeing this for a few reasons," Schawinski says. First, GALEX is a space telescope, so it can see far-UV light that's blocked by Earth's atmosphere.

Also, GALEX is designed to take a broad view of the sky. Its relatively small 20-inch primary mirror gives it a wide, 1.2-degree field of view, making it more likely to catch the UV flash preceding a supernova.

With these advantages, GALEX is uniquely equipped to catch a supernova before it explodes. "Just when we like to see it," Schawinski says.

For more information, visit www.galex.caltech.edu, "Ultraviolet Gives View Inside Real 'Death Star'." Kids can check out how to make a mobile of glittering galaxies at spaceplace.nasa.gov/en/kids/galex_make1.shtml.

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

Planets Close To the Moon

Times are Hawaii Standard Time

- Aug 2, 03h, M 2.1° SSW of Venus (15° from sun in evening sky)
- Aug 3, 00h, M 3.4° SSW of Saturn (26° from sun in evening sky)
- Aug 3, 23h, M 3.6° SSW of Mars (38° from sun in evening sky)
- Aug 13, 05h, M 2.8° SSE of Jupiter
- Aug 16, 09h, M 0.77° N of Neptune (179° from sun in midnight sky)
- Aug 18, 13h, M 3.7° NNW of Uranus (155° from sun in morning sky)

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

Other Events of Interest

Times are Hawaii Standard Time

- Aug 1, 00:13h, Moon New
- Aug 5, 17h, Venus 1.0° NNE of Regulus (16° from sun in the evening sky)
- Aug 6, 11 Parthenope at Opposition
- Aug 12, Perseid meteors
- Aug 13, 08h, Venus 0.23° S of Saturn (18° from the sun in evening sky) (Closest planet-planet appulse this year)
- Aug 14, 21h, Mercury, Venus, and Saturn within a circle of 2.73° (17° east of the sun in evening.)
- Aug 15, 22h, Neptune at opposition.
- Aug 16, 11:17h, Moon Full
- Aug 20, 1h, Mercury 0.93° SW of Venus (20° from the sun in evening sky)
- Aug 30, 09:58, Moon New

<p> Mercury</p> <p>is visible in the evening sky in mid-month, close to Venus and Saturn.</p>	<p> Venus</p> <p>is low in the west after sunset. It has a very close conjunction with Saturn on Aug 13.</p>	<p> Mars</p> <p>is still low in the south-west after sunset.</p>
<p> Jupiter</p> <p>is very well placed for viewing this month and is in the sky most of the night.</p>	<p> Saturn</p> <p>is low in the southwest after sunset. Is very close to Venus and Mercury on August 14.</p>	<p> Uranus</p> <p>rises in mid-evening and is high enough for easy viewing by midnight.</p>
<p> Neptune</p> <p>reaches opposition this month and is in the sky all night.</p>	<p> Dwarf Planet Pluto</p> <p>is still well placed for observing or imaging in August near Jupiter.</p>	<p> Asteroid (11) Parthenope</p> <p>reaches opposition on August 6 at magnitude 8.8.</p>

Meteor Log - August 2008

by Mike Morrow

If you live north of the equator, this is Perseid month.. Sporadic rates continue to rise. The Perseids are partly Moon free.

Tuesday the 12th, the Perseids. Radiant 03h16m +58 deg. The shower is a bit active from July 17 through August 24th. Rates at maximum are about 60 meteors an hour. At times the rates may be about double. The radiant is visible from about 11PM local time onward. This year the Moon will set between midnight and about 1:30 AM local time. Hawaii is in a good location for the shower maximum. The Perseids are fast, often bright and frequently leave persistent trains.

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

Minor Planet Report - August 2008 by Carey Johnson

Comet Events

8/5 P/2001 R1 (LONEOS) Perihelion 1.345 AU, Mag. 16.87

8/9 6P/d'Arrest 0.356 AU from Earth, Mag. 12.95

8/14 6P/d'Arrest Perihelion 1.354 AU, Mag. 12.96

8/30 P/2003 K2 (Christensen) 1.340 AU from Earth, Mag. 18.4

Asteroid Events

8/6 (11) Parthenope at Opposition, Mag. 8.8

8/6 2007 RT12 0.0463 AU from Earth, Mag. 19.6

8/15 (35107) (1991 VH) 0.046 AU from Earth Mag. 14.4

8/15 2006 BJ55 0.044 AU from Earth, Mag. 20.61

	Magnitude			Magnitude	
Comets	Aug 1	Aug 31	Asteroids (cont.)	Aug 1	Aug 31
C/2007 W1 (Boattini)	8.4	10.3	(11) Parthenope	8.7	9.0
19P/Borrelly	9.5	10.0	(2) Pallas	8.8	8.5
6P/d'Arrest	10.6	11.0	(43) Ariadne	9.8	9.5
C/2006 OF2 (Broughton)	11.6	11.2	(9) Metis	10.0	9.5
C/2007 N3 (Lulin)	11.7	11.3	(17) Thetis	10.1	10.7
C/2007 G1 (LINEAR)	12.0	12.1	(3) Juno	10.2	10.5
C2006 Q1 (McNaught)	12.1	12.3	(51) Nemausa	10.3	10.8
85P/Boethin	13.1	11.6	(216) Kleopatra	10.5	9.9
C/2007 B2 (Skiff)	13.3	13.5	(346) Hermentaria	10.5	10.8
7P/Pons-Winnecke	13.5	12.8	(79) Eurynome	10.6	10.3
C/2008 J1 (Boattini)	13.5	13.9	(7) Iris	10.6	10.8
15P/Finlay	13.6	14.7	(20) Massalia	10.6	11.0
Asteroids			(130) Elektra	10.7	10.3
(4) Vesta	7.4	7.0	(128) Nemesis	10.7	10.9

See <http://www.geocities.com/quarkcsj/calendar.html> for more up to date info.

▶ August 2008

Printat

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27 [Add]	28 [Add]	29 [Add] South Delta-Aquarids Meteor Shower Peak	30 [Add]	31 [Add]	1 [Add] New Moon Alpha Capricornids Meteor Shower Peak	2 [Add] 6:30p Dillingham Public Star Party
3 [Add] 3:30p HAS Board Meeting	4 [Add]	5 [Add] Comet P/2001 R1 (LONEOS) Perihelion (1.345 AU) M 16.87 7:30p HAS Meeting	6 [Add] Southern Iota Aquarids Meteor Shower Peak Asteroid 11 Parthenope At Opposition (8.8 Magnitude)	7 [Add]	8 [Add]	9 [Add] Comet 6P/d'Arrest Closest Approach To Earth (0.356 AU) M 12.95 6:30p Kahala & Waialeale Public Star Parties
10 [Add]	11 [Add]	12 [Add] Perseids Meteor Shower Peak	13 [Add]	14 [Add] Comet 6P/d'Arrest Perihelion (1.354 AU) M 12.96	15 [Add] Neptune At Opposition M 7.8 Asteroid 35107 (1991 VH) Near-Earth Flyby (0.046 AU) M 14.46*	16 [Add] Full Moon
17 [Add]	18 [Add]	19 [Add]	20 [Add]	21 [Add]	22 [Add]	23 [Add] 6:30p Dillingham Public Star Party
24 [Add] For more events look here.	25 [Add] Northern Iota Aquarids Meteor Shower Peak	26 [Add]	27 [Add]	28 [Add]	29 [Add]	30 [Add] New Moon Comet P/2003 K2 (Christensen) Closest Approach To Earth (1.340 AU) 6:30p Club Star Party
31 [Add] 3:30p HAS Board Meeting	1 [Add] 25-6 Alpha Aurigids (AUR) Asteroid 1998 SD9 Near-Earth Flyby (0.024 AU) M 17	2 [Add] 7:30p HAS Meeting	3 [Add]	4 [Add] Comet C/2008 A1 (McNaught) Closest Approach To Earth (1.325 AU) M 8	5 [Add] Asteroid 43 Ariadne At Opposition (9.8 Magnitude)	6 [Add] 6:30p Kahala & Waialeale Public Star Parties

STEREO Creates First Images of the Solar System's Invisible Frontier

NASA's sun-focused Solar Terrestrial Relations Observatory, or STEREO, twin spacecraft unexpectedly detected particles from the edge of the solar system last year. This helped scientists map the energized particles where the hot solar wind slams into the cold interstellar medium.

The two STEREO spacecraft were launched in 2006 into Earth's orbit around the sun to obtain stereo pictures of the sun's surface and measure magnetic fields and ion fluxes associated with solar explosions. From June to October 2007, sensors aboard both STEREO spacecraft detected energetic neutral atoms originating from the same spot in the sky, where the sun plunges through the interstellar medium.

Mapping the region by means of neutral, or uncharged, atoms instead of light "heralds a new kind of astronomy using neutral atoms," said Dr. Robert Lin, professor of physics at the University of California, Berkeley and lead for the suprathermal electron sensor aboard the STEREO spacecraft. "You can't get a global picture of this region, one of the last unexplored regions of the heliosphere, through normal telescopes," Lin said. The heliosphere is a bubble in space produced by the solar wind. It stretches from the sun to beyond the orbit of Pluto. The solar wind streams off the Sun in all directions at great speeds. Once beyond the orbit of Pluto, this supersonic wind must slow down to meet the gases in the interstellar medium. As the solar wind slows, it changes direction to form a comet-like tail behind the sun. This subsonic flow region is called the heliosheath.

The results, reported in the July 3 issue of the journal *Nature*, clear up a discrepancy in the amount of energy dumped into space by the decelerating solar wind. The solar wind was detected when Voyager 2 entered the heliosheath.

Researchers determined that the newly discovered population of ions in the heliosheath contains about 70 percent of the dissipated energy from the solar wind, exactly the amount unaccounted for by Voyager 2's instruments. The Voyager 2 results also are reported in the July 3 issue of *Nature*. The Berkeley team concluded that these energetic neutral atoms were originally ions heated up in the termination shock area that lost their charge to cold atoms in the interstellar medium and, no longer hindered by magnetic fields, flowed back toward the sun and into the sensors aboard STEREO.

"This is the first mapping of energetic neutral particles from the edge of the heliosphere," Lin said. According to Lin, the neutral atoms are probably hydrogen, which comprise most of the particles in the local interstellar medium. The charge exchange between hot ions and neutral atoms to generate energetic neutral atoms is well known around the sun and planets, including Earth and Jupiter. Spacecraft have used this as a means of remotely measuring the energy in ion plasmas since neutral atoms travel much farther than ions.

NASA plans to launch the Interstellar Boundary Explorer, or IBEX, later this year to more thoroughly map the boundary of the solar system.

For more information about NASA's STEREO mission, visit:

<http://www.nasa.gov/stereo>

HAS Financial Report as of July 15, 2008

Initial Balance:	\$4,610.65
Receipts:	
Donations	35.00
Dues Received	142.00
Magazine Payment	32.95
Total Income:	\$209.95
Expenses:	
Astronews	152.30
Magazine Subscriptions	34.00
Postage	3.21
Refreshments	16.09
Total Expenses:	\$205.60
Final Balance	\$4,615.00

The club membership increased by two this month. The new members include **William Pigott**, and **Carolyn Kaichi**. A special thanks to **Ellen Pyle**, **James Branchaud** and **Gregory Ha** for their donations. Thanks and clear skies to all!

Upcoming School Star Parties

Fri. 9/5 Mililani Mauka.

In addition to telescopes, I need someone to give a 25 minute presentation with computer projection inside to split the crowd into two parts.

Forrest.

If you are interested in helping out at a School Star Party, sign up on the monthly sheet at the HAS Meeting or contact the Star Party Coordinator: Forrest Luke at 623-9830 or e-mail at lukef003@hawaii.rr.com

Newsletter Submissions

If you would like to submit an article, note, picture, astro-items for sale, etc., contributions are welcome. Send them to the Editor at quarkcsj@hotmail.com. The deadline is the 16th of each month.



Moon June 11, 2008

Plato, low sun angle

By: Freddy Willems

Posted to the HAS Yahoo Group: Jun 13, 2008

HAS Yahoo Group

<http://tech.groups.yahoo.com/group/HawaiianAstronomicalSociety/>

Electronic Newsletter

This month's link was posted

July 16th at:

http://kilolani.net/astronews/Astronews_2008-07NGC7003.pdf

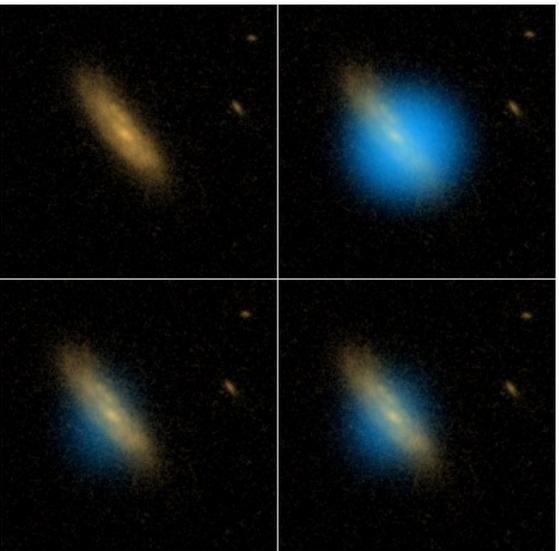
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Sequence of images shows supernova start to finish. The top left image shows the galaxy before the supernova. At top right, the bright UV flash called the shock breakout indicates a red supergiant has collapsed. At bottom left, moments later, the flash is mostly gone. As the debris expands, it heats up again and becomes brighter (bottom right). The supernova became 10 times the size of the original over the following few days, thus becoming visible to supernova hunters.

(See NASA's Space Place article on page 5.)