The Astronews

HUI KILOLANI

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March 2004

Celestial "Bling"

Editor

Twinkling in the sky is a diamond star of 10 billion trillion trillion carats, astronomers have discovered. The cosmic diamond is a chunk of crystallized carbon, 4,000 km across, some 50 light-years from the Earth in the constellation Centaurus.

It's the compressed heart of an old star that was once bright like our Sun but has since faded and shrunk.

"You would need a jeweler's loupe the size of the Sun to grade this diamond," says astronomer Travis Metcalfe, of the Harvard-Smithsonian Center for Astrophysics, who led the team of researchers that discovered it.

The diamond star completely outclasses the largest diamond on Earth, the 530-carat Star of Africa which resides in the British Crown Jewels.

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Inside this issue:

Upcoming Star Parties

Public Party	**Mar 13**	**Dillingham**
Club Party	**Mar 20**	**Dillingham**
Public Party	**Mar 27**	**Kahala/Waikele**
Public Party	**Apr 10**	**Dillingham**
Club Party	**Apr 17**	**Dillingham**
Public Party	**Apr 24***	**Kahala/Waikele**

Upcoming Events:

- The next meeting is at 7:30 p.m. on Tue. Mar. 2rd at the Bishop Museum
- **Sam Rhoads** next Planetarium show on Mon. Mar. 1st.

* Astronomy Day

President's Message

I'm past the midway point of my trip to New Zealand, but I have relatively few astronomical experiences to report on so far. I've been staying in Auckland, and there have been precious few clear nights so far. At first, it made little difference; since I arrived on a waxing gibbous Moon, many of the subtle delights of the southern sky were washed out and indistinguishable from the background sky. Even at its best, Auckland, home to about a quarter of the country's four million people, suffers from light pollution.

However, I have had a few clear patches lately, and I've managed to find a number of the biggies and view them with ten power binoculars, the only observing instrument so far available to me. When I first arrived, I was able to pull out my new Zire 71 palm computer, bring up former HAS President Kevin Polk's 2sky program (v2.7.8), and orient myself to the Auckland sky. The Southern Cross was up high, but other than that the view wasn't too exciting. More recently, though, I've had enough dark clear time to locate the Large and Small Magellanic Clouds, the Gem Cluster, the Jewel Box, and the Eta Carina nebula. Confirming a sighting of IC2602, the Southern Pleiades, was quite easy when I zoomed in to a two-degree window in 2sky. Then the clouds returned.

A Google search on "amateur astronomy New Zealand" led me to little in the way of announced regular observing sessions offered by local astronomy clubs. I will probably make a visit to the Auckland Observatory. There is public viewing on the "courtyard telescope" following the planetarium show. That will probably be my best chance for telescopic viewing here. The trick will be picking a night that turns out to be clear after the show.

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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.

Observer's Notebook—March 2004

by Jay Wrathall

Planets Close to the Moon

Times are Hawaii Standard Time

Mar 1, 00h, M 4.6° N of Saturn
(115° from sun in evening sky)
Mar 6, 08h, M 2.9° NNE of Jupiter
(176° from sun in midnight sky)
Mar 13, 147h, M 1.3° SSE of Neptune
(39° from sun in morning sky)
Mar 18, 13h, M 4.0° SSE of Uranus
(24° from sun in morning sky)
Mar 21, 20h, M 3.2° SSE of Mercury
(16° from sun in morning sky)
Mar 24, 13h, M 2.0° SSE of Venus
(46° from sun in evening sky)
Mar 25, 14h, M 0.79° NNW of Mars
(57° from sun in evening sky)
Mar 28, 09h, M 4.7° N of Saturn
(57° from sun in evening sky)

Other Events of Interest

Times are Hawaii Standard Time

Mar 3, 15h, Mercury at superior conjunction
(Passes into evening sky)
Mar 3, 19h, Jupiter at opposition
Mar 6, 13:16h, Full Moon
Mar 19, 20:49h, Vernal Equinox
Mar 20, 12:43h, New Moon
Mar 29, 02h, Mercury at greatest elongation
(18.9° east of the sun in evening sky)
Mar 29, 06h, Venus at greatest elongation
(46.0° east of the sun in evening sky)

The Planets in March

Mercury

M. has a fine evening appearance in the last half of March, low in the west after sunset.

Venus

Venus shines very brightly in the western sky after sunset at magnitude -4.1.

Mars

Mars is about mag. 1.5 and is in the SE after sunset above Venus near the Pleiades.

Jupiter

Jupiter is at opposition March 3 and is in the sky all night. Mag. -2.5. Diameter, 44.4".

Saturn

Saturn is near the meridian at sunset and is well placed for evening viewing. Mag. 0.0.

Uranus

Uranus rises in the east just before dawn and is still too close to the sun for easy viewing.

Neptune

Neptune rises before Uranus but will be better placed for viewing later in the year.

Pluto

Pluto is visible in the early morning hours, but will be easier to view during the summer.

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I borrowed a 3.2 megapixel Fujifilm Finepix digital camera for the trip. I tried to take a shot of Omega Centauri through the binoculars, but it appears that nothing was recorded. The binocular trick worked for birds at the beach, but not for the stars. I'll recheck the manual and perhaps try again, but this camera was not designed for astrophotography. I'll still save the files and try to bring something out by processing them.

I'm headed south to volcano country for the remaining few days of my trip. I don't know if I'll run into a telescope there, but at least the sky should be darker.

Chris

Meeting Minutes

H.A.S. Secretary

The February 3, 2004 meeting was called to order by Vice President Barry Peckham at 7:34 p.m. in the Atherton Halau, Bishop Museum. Twenty-nine members and seven visitors were in attendance. President Chris Peterson was out of town. Barry greeted the membership and inquired of our visitors what their interests were. Our visitors were interested in learning about telescopes and attending star parties in safe locations.

Old Business

Barry asked for help with our monthly 5-minute, quick information sessions for new and old members. A list of subjects will be printed in the Astronews. Anyone interested in sharing their expertise on the subjects listed are asked to contac Barry Peckham or any of the HAS board members.

Gretchen West shared letters from Kamehameha student who attended a November school star party. She also invited all members in attendance to the U. H. Colloquium on February 5, 2004. Astronaut Ed Lu, who spent 184 days in space aboard the International Space Station is the featured speaker. She also showed a 2004 calendar graced with gorgeous color pictures of deep space objects.

Jim Bedian urged HAS members to consider attending AstroCon 2004, July 20-July 24, in the San Francisco Bay area. For further information contact Jim Bedian.

New Business

Barry Peckham spoke for 5 minutes on how to choose a good pair of night viewing quality binoculars.

School Star Parties

Forrest Luke reports that there is one school star party scheduled for February 27. He asked for volunteers to help out. He also reported that the date for the Kamehameha Schools has changed from Friday April 16 to Thurs. April 15.

Guest Speaker

Dr. Karen Meech, was our featured speaker at the HAS February meeting. Dr. Meech began with a brief history of comets as seen throughout the ages, touching on our earliest views of comets and what humans imagined that comets foretold. Moving on, Karen spoke of the titans of comet research, Tycho Braehe, Edward Halley and Isaac Newton. Dr. Meech spoke of later theories on the make-up of comets which were proposed by Whipple and Lytleton. She discussed the upcoming "Star Dust" mission and the comet Wild II.

She also elaborated on mission "Deep Impact," for which Dr. Meech is a project director. She explained details about the December 2004 blast-off and the July 4, 2005 impact with comet Temple I. The impact time for Hawaii will be "around twilight, near Spica." and may be visible to observers here in Hawaii.

Steve Huffman exhibited two more laser created crystals. The total of three crystals depict galactic structure, the Milky Way galaxy, and a globular cluster.

The meeting adjourned at 8:47 p.m.. A short Planetarium show and discussion of February night skies began at 9:00 p.m..

Respectfully submitted,
Gretchen West, HAS Secretary

Meteor Log—March 2004

by Mike Morrow

March continues with low sporadic rates and a few minor showers.

Early March thru early April (several peaks)

The ***Virginids***.

Radiant (position for the 24th) 13h00m -04 deg. we are looking a generally less than 5 meteors per hour.

Virginid meteors generally come from a large area around 2h in RA by 20 deg in Dec. which slowly moves through Leo, Virgo and on towards Libra by mid-April. The Moon does not help in early March.

The meteors are normally slow, but some can be bright and a few leave persistent trains.

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

School Star Parties

It's that time of year, and School Star Parties are once again being coordinated by Forrest Luke. If you are contacted for a school star party, please have the school contact Forrest directly by phone at 623-9830 or via e-mail at <lukef003@hawaii.rr.com>.

As a reminder, upcoming scheduled school star parties are:

12 Mar 2004 Niu Valley Middle School
15 Apr 2004 Kamehameha Schools, Kapalama Campus
23 Apr 2004 Lanakila Elementary
27 Apr 2004 Ala Wai Elementary

If you signed up and need help finding the school, or if you didn't sign up, but still want to participate, please contact Forrest.

Deep Space 2 for 1 Sale!

by Patrick L. Barry

Call it a “buy one, get one free” sale for astronomers: Build a network of radio dishes for communicating with solar-system probes, get a world-class radio telescope with a resolution nearly as good as a telescope the size of Earth!

That's the incidental bonus that NASA's Deep Space Network (DSN) offers the astronomy community. Designed to maintain contact with distant spacecraft in spite of the Earth's rotation, the large, widely spaced dishes of the DSN are ideal for performing a form of radio astronomy called "very long baseline interferometry" (VLBI).

VLBI produces very high resolution images of the cosmos by combining the output from two or more telescopes. The result is like having a giant “virtual” telescope as large as the distance between the real dishes!

Since bigger telescopes can produce higher resolution images than smaller ones, astronomers need to use dishes that are as far apart as possible.

That need dovetails nicely with the DSN's design. To maintain continuous contact with deep space missions, the DSN has tracking stations placed in California, Spain, and Australia. These locations are roughly equally spaced around the Earth, each about 120 degrees of longitude from the others-that way at least one dish can always communicate with a probe regardless of Earth's rotation. That also means, though, that the straight-line distance between any two of the stations is roughly 85 percent of Earth's diameter-or about 6,700 miles. That's almost as far apart as land-based telescopes can be.

“We often collaborate with other VLBI groups around the world, combining our dishes with theirs to produce even better images,” says Michael J. Klein, manager of the DSN Science Office at NASA's Jet Propulsion Laboratory. “Since our 70-meter dish in Canberra, Australia, is the largest dish in the southern hemisphere, adding that dish in particular makes a huge difference in the quality of a VLBI observation.”

Even though only about 1 percent of the DSN's schedule is typically spared from probe-tracking duty and scheduled for radio astronomy, it manages to make some important contributions to radio astronomy. For example, the DSN is currently helping image the expanding remnant of supernova 1987A, and Dr. Lincoln Greenhill of the Smithsonian Astrophysical Observatory is using the DSN dishes

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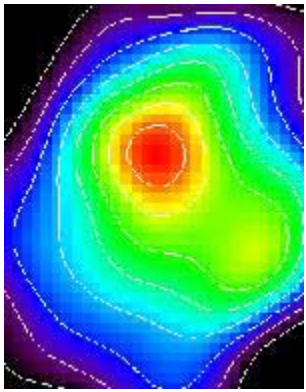
Evidence for Planets around Vega

by PPARC

Astronomers at the Particle Physics and Astronomy Research Councils UK Astronomy Technology Centre (ATC) at the Royal Observatory, Edinburgh have produced compelling new evidence that Vega, one of the brightest stars in the sky, has a planetary system around it which is more like our own Solar System than any other so far discovered.

All of the hundred or so planets that have been discovered around other stars have been very large gaseous (Jupiter-like) planets orbiting close to their star. This is very unlike our own Solar System. New computer modeling techniques have shown that observations of the structure of a faint dust disk around Vega can be best explained by a Neptune-like planet orbiting at a similar distance to Neptune in our own solar system and having similar mass. The wide orbit of the Neptune-like planet means that there is plenty of room inside it for small rocky planets similar to the Earth—the Holy Grail for astronomers wanting to know whether we are alone in the Universe.



The modeling, which is described in ***The Astrophysical Journal*** (1 December 2003), is based on observations taken with the world's most sensitive sub millimeter camera, SCUBA. The camera, built at the ATC, is operated on the James Clerk Maxwell Telescope in Hawaii. The SCUBA image shows a disk of very cold dust (-180 degrees centigrade) in orbit around the star.

The irregular shape of the disk is the clue that it is likely to contain planets explains astronomer Mark Wyatt, the author of the paper. Although we cant directly observe the planets, they have created clumps in the disk of dust around the star.

The modeling suggests that the Neptune-like planet actually formed much closer to the star than its current position. As it moved out to its current wide orbit over about 56 million years, many comets were swept out with it, causing the dust disk to be clumpy. Exactly the same process is thought to have happened in our Solar System, said Wyatt, Neptune was pushed away from the Sun because of the presence of Jupiter orbiting inside it. So it appears that as well as having a Neptune-like planet, Vega may also have a more massive Jupiter-like planet in a smaller orbit.

The model can be tested in two ways as Wayne Holland, who made the original observations, explains. The model predicts that the clumps in the disk will rotate around the star once every three hundred years. If we take more observations after a gap of a few years we should see the movement of the clumps. Also the model predicts the finer detail of the disks clumpiness which can be confirmed using the next generation of telescopes and cameras.

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History of the HAS

by Jay Wrathall

From the very beginning of HAS, the club has sponsored public star parties, usually on special occasions such as eclipses and close approaches of planets. One of the first events we have a record of was a star party at Kapiolani Park in 1954 during a close approach of Mars with over 500 people in attendance. During the 1950s, 60, and 70s, many such star parties were held, often in conjunction with Bishop Museum.

However, star parties that were primarily for members started relatively recently. There were undoubtedly many occasions in the early years when member got together for observing sessions, but these were not sponsored by the club and were not reported in the Astronews. Occasional "picnic/observing" events were mentioned in 1977 but these were not held on a regular basis and none were held in 1978 or 1979. However, in the July, 1980 issue of the Astronews the following announcement appeared: "Those members who may be interested in a night of viewing . . . should contact either Bob Terry or Ray Fabré at the next meeting. You don't have to stay all night and you don't even need a telescope. You can look through the scopes brought by other members." This resulted in a star party at Dillingham on July 11, with 10 members in attendance. From then on, star parties were held on an irregular basis, generally three or four times a year, but with increasing frequency. About mid-1982 these parties became a monthly event, and have remained so ever since.

The attendance at these early star parties was generally pretty low. In the November, 1982 Astronews, for example, the following comment was made: "Our October star party/picnic had a very light turnout. The 16-17 people who turned out had nice clear skies from dusk 'till dawn. . . However, some of the club officers were once again stuck with several cases of leftover sodas." Most of these early parties were held at Iroquois Point, but beginning in January of 1983 arrangements were made with the military to allow the club to use an old runway at Barbers Point. This became the regular site for the rest of the 1980's and attendance gradually increased. By the end of the decade the average attendance was between 50 and 100 people. However, by the early 1990's Barbers Point was becoming

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History *(Continued from page 8)*
pretty bright and members started to talk about finding a new site.

Then the first Iraq war began, and the military started to make it difficult for the club members to get onto the base. There were often delays and problems, culminating in January of 1991 when the club was refused entry to the base, even though there were about thirty cars and close to 100 people waiting outside the gate. Sue Girard reported in the February, 1991 Astronews: "...we decided to try someplace else and it turned out to be a very serendipitous decision. Most of us (10 to 15 cars and 30-40 people) drove out to Dillingham glider field and found a little area tucked away off the airstrip with very dark skies. It seems to have many of the elements necessary for a decent observing site such as safety, ease of access, a large area for cars and equipment, and, most importantly, DARK SKIES! In fact, this area is far better than Barbers Point, and since it is state land, we may not have any problem getting access to it on a regular basis." Since then, Dillingham has been our regular observing site.

For a while in the early 1990's, some star parties were also held at Silva's Ranch on the Waianae side of the island, but use of that site was eventually discontinued for a number of reasons, including lots of wind and dust.

Monthly star parties have become such an integral part of the club that it is hard to imagine HAS without them. In the last few years a second monthly star party for members only has been added and two other public parties are scheduled near the first quarter moon. With at least four regularly scheduled parties a month I doubt if there is another astronomy club in the country that provides its members with as many opportunities for observing as we do.

Vega *(Continued from page 7)*

Paradoxically the star barely appears in the SCUBA image because it is far too hot to be seen with this kind of detector. Vega is, however, easily seen with the naked eye. It is the fifth brightest star visible in Hawaii skies and is bluish-white in color.

Facts about Vega

- It is the 5th brightest star in the sky, behind Sirius, Canopus, Rigel Kentaurus (α Centauri) and Arcturus.
- It is 25light years away from the Sun, has a diameter three times that of the Sun, and is 58 times brighter than the Sun.
- Vega is the brightest star in the constellation Lyra, the Harp. The lyre, or harp, is supposed to have been invented by the Greek God Hermes who gave it to his half-brother Apollo. Apollo then gave it to his son Orpheus, the musician of the Argonauts.
- Vega was the first star ever to be photographed. During the night of July 16-17, 1850 the historic picture was taken at Harvard Observatory using a 15 inch refractor telescope during a 100 second exposure.

Treasurer's Report

by Jim MacDonald

HAS Financial Report as of January 15, 2004

Initial Balance:	$5,760.23
Receipts:	
Astronomy Payment	116.00
Sky & Telescope Payment	164.75
Donation	91.05
Dues Received	327.00
T-Shirt Sales	15.00
Total Income:	$713.80
Expenses:	
Astronews	150.43
Magazine Subsciptions	591.45
Refreshments	11.42
Postage	7.09
Total Expenses:	$760.39
Final Balance	$5760.23

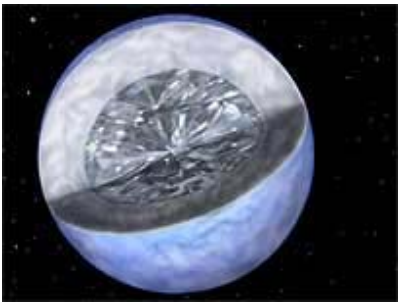
We had fourteen new members join the club this month. They are **Michael Baker**; **Beverly Bigbee**; **Pat** and **Eleanor Balvin**; **Radoje Maric**; **Branka Knezevic**; **Thomas, Michelle** and **Thomas Jr. McEnulty**; **David Johnson**; **Phillip Slocum**; **Han Xu**; and **Bill** and **Fran Parker**. Many thanks to those renewing their membership and especially to **James Branchaud**, Scott **T. Allen**, **Paul Erickson**, **Diane Kellett**, **Bill and Fran Parker**, and **Jean** and **Tosh Taniguchi** for their generous donations. Clear Skies to all!

Special Notice

HAS will publish a complete listing of Club members in the May 2004 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 April 15 by sending him an e-mail at jim.macd@verizon.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. HAS does make this list available to, nor do we sell its contents to anyone for any purpose.

Cosmic "Bling" *(Continued from page 1)*

The huge cosmic diamond - technically known as BPM 37093 - is actually a crystallized white dwarf. A white dwarf is the hot core of a star, left over after the star uses up its nuclear fuel and dies. It is made mostly of carbon.



For more than four decades, astronomers have thought that the interiors of white dwarfs crystallized, but obtaining direct evidence became possible only recently.

The white dwarf is not only radiant but also rings like a gigantic gong, undergoing constant pulsations.

"By measuring those pulsations, we were able to study the hidden interior of the white dwarf, just like seismograph measurements of earthquakes allow geologists to study the interior of the Earth.

"We figured out that the carbon interior of this white dwarf has solidified to form the galaxy's largest diamond," says Metcalfe.

Astronomers expect our Sun will become a white dwarf when it dies 5 billion years from now. Some two billion years after that, the Sun's ember core will crystallize as well, leaving a giant diamond in the centre of the solar system.

"Our Sun will become a diamond that truly is forever," says Metcalfe.

Scope for Sale

- 1991 Model (1 star + Lat./Long Alignment) ***Meade LX200*** 8" SCT scope with manual, 8x50 Finder Scope, Telrad
- 10mm, 18mm, 35mm, 6.4mm, 26mm eyepieces, Barlow
- Scope Case, 8" Dewshield, Maglite, Red Flashlights (2)
- Red, Blue, Green, Yellow, Yellow-Green, Lt. Red, Orange, Moon, O-III, DS, UHC and H-Beta Filters
- Dew Gun, Accessory Case, Hand-held GPS, 12v external power supply, charger, and all connectors, 8" full aperture solar filter

$2,750.00 Complete including personal instruction on set up & use.
Dave: 623-9466 <TwoCajuns@mac.com>

2 for 1 *(Continued from page 6)*

to explore a new way to measure the distances and velocities of galaxies.

And all this comes as a "bonus" from the dishes of the DSN.

To introduce kids to multi-wavelength astronomy, NASA's website for kids, The Space Place, has just added the interactive demo, "Cosmic Colors," at:

spaceplace.nasa.gov/cosmic.

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MGC 2237 Rosette Nebula photo by Stephen Pitt (light-to-dark.com)