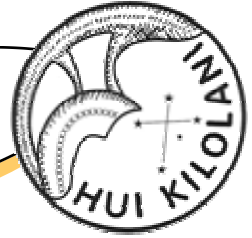


The Astronews



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May 2003

In Search of Alien Oceans

by Patrick L. Barry and Dr. Tony Phillips

A robotic submarine plunges into the dark ocean of a distant world, beaming back humanity's first views from an alien ocean. The craft's floodlights pierce the silty water, searching for the first, historic sign of extraterrestrial life.

Such a scenario may not be as fantastic as it sounds. Many scientists believe that Jupiter's moon *Europa* conceals a vast ocean under its icy crust. If so, heat from the moon's interior—which would keep the ocean from freezing solid—may also drive subaquatic volcanoes and hydrothermal vents. On Earth, such deep-sea vents provide chemical energy for ecosystems that thrive without sunlight, and some scientists even

(Continued on page 5)

Upcoming Star Parties

Public Party	May 3	Dillingham
Public Party	May 10	Kahala Park
Club Party	May 24	Dillingham
Public Party	May 31	Dillingham
Public Party	Jun. 7	Kahala Park
Public Party	Jun. 21	Dillingham

Inside this issue:

Club Information	2
Observer's Notebook	3
Meeting Minutes	4
School Star Parties	6
Meteor Log	6
Equipment Report	7
Science Fair Winners	9
Treasurer's Report	10



Upcoming Events:

- The next meeting is 7:30 on May 6th at Bishop Museum.
- **Sam Rhodes** next Planetarium show on Mon. May 5th.
- **Astronomy Day** at Kahala Mall Barnes & Noble on Saturday, May 10.

President's Message

I got fooled by the weather in April ... twice. I was getting ready to go to Dillingham for the HAS public star party, but I checked the weather on TV and heard a forecast of heavy rain with possible thunderstorms. I went outside and took a long hard look at the sky, and I decided that the trip to Dillingham wasn't worth the trouble. As it turns out, the weather out there was fine.

The next week, it was raining at my house when I left for the Kahala Community Park star party, so I didn't bother to take my telescope. I thought I should put in an appearance, but I didn't expect that anyone would even bother to set up a telescope. As soon as I got there, the sky started to clear, and we ended up having a good night. So remember, even the worst looking nights can turn out to be good ones.

Not only did the sky oblige, but club member Mayra Vega had arranged for Midweek to send a reporter and photographer to do a story on HAS and our Kahala star parties. I don't know when the story will appear, but keep your eyes peeled for it. We may be able to use this publicity to further our efforts at reducing light pollution in Honolulu.

Astronomy Day is coming up. We will discuss our plans at the May meeting. If you're just not a late night person but would like to contribute to the club, here's a perfect daytime opportunity to spread the word about astronomy.

You don't always need a telescope to enjoy astronomy. Learning the constellations (and the stories about them from various cultures) can occupy you for many years. Following the planets as they move through star fields is a good way to feel the rhythms of nature at different time scales.

Even though we think of the stars as

(Continued on page 3)

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Planets Close to the Moon

Times are Hawaii Standard Time









- May 4, 22h, M 3.3° N of Saturn
(42° from sun in evening sky)
- May 8, 10h, M 4.1° NNE of Jupiter
(82° from sun in evening sky)
- May 21, 04h, M 5.1° SSE of Neptune
(107° from sun in morning sky)
- May 21, 12h, M 2.9° SSE of Mars
(103° from sun in morning sky)
- May 22, 17h, M 4.5° SSE of Uranus
(89° from sun in morning sky)
- May 28, 14h, M 2.3° NNW of Mercury
(24° from sun in morning sky)
- May 28, 17h, M 0.24° NW of Venus
(22° from sun in morning sky)

Other Events of Interest

Times are Hawaii Standard Time

- May 1, 02:15h, New Moon
- May 3, 0h, 3 Juno at opposition
- May 6, 21h, Mercury at inferior conjunction
with sun, passes into morning sky.
- May 10, Astronomy Day
- May 15, 17:35h, Full Moon
- May 26, 07h, Mercury 2.2° SSE of Venus
(23° from sun in morning sky)
- May 28, 15h, Moon, Venus and Mercury within
a circle of diameter 2.66°.
(22° from sun in morning sky)
- May 30, 18:20h, New Moon

The Planets in May

 Mercury Mercury is visible late in May in the morning sky. Near Venus and the Moon on May 28.	 Venus Venus is visible low in the east before dawn, with a magnitude of -3.9.	 Mars Mars rises near midnight and will brighten to -0.6 mag and reach a diam of over 10" this month.
 Jupiter Jupiter is in the SE at sunset and well placed for viewing all evening at mag -2.0.	 Saturn Saturn is past it best, but can be viewed for about 2 hours in early evening. Mag. +0.1.	 Uranus Uranus is in the east in the pre-dawn hours. It will be better viewed later in the year.
 Neptune Neptune is near Mars, rising about midnight. Magnitude, +7.9	 Pluto Pluto rises about 9:00 pm and can be viewed after midnight.	

Pres. Report (Continued from page 2)
 “fixed”, at least compared to the planets, there are occasional changes that we can notice. One of them is happening now. The star Dschubba (Delta Scorpii), the middle star in the head of the Scorpion, used to be almost the same brightness as the stars to either

side of it. Now, however, it has brightened considerably. Scorpius is coming up well before midnight now. Take a look next time you have a chance, and see one of the most dramatic changes among the stars that you are likely to have the opportunity to see.

Chris

The April 1, 2003 meeting was called to order by President Chris Peterson at 7:35 p.m in Hale Kea, at the Bishop Museum, with thirty-three members in attendance.

Members had already set up tables and the first annual Hawaiian Astronomical Society Swap meet was in full swing.

President Chris Peterson asked members to fill out an interest survey to help the Board of Directors to plan meetings on topics of interest to club-members.

School Star Parties: Sign-ups for star trippers to help with school star parties were needed for April.

(April 4th- Lanakila School in Kalihi 6:40 pm., April 7th- Voyager School at Kakaako Park - 6:40 pm, April 25 - Niu Valley Intermediate - 6:40 pm.)

Vice President Barry Peckham recommended to members that if they know of anyone who wishes to have a special star party or some other astronomy related event, please contact Board members or Forrest Luke.

Astronomy Day—We would like to remind everyone that May 10, 2003 is National Astronomy Day. This year's activities will take place at Barnes & Noble, Kahala Mall. We will be sharing the daytime sky, moon tours and sunspot viewing, on the upper level outside of the bookstore. Everyone who would like to participate is urged to join us about one o'clock (1:00)p.m.

The Public Star Party at Kahala Community Park later that evening will extend our activities to views of the moon, constellations, and brighter stellar objects.

Hawaii State Science and Engineering Fair was held April 1 and 2. Our agency judges, President Chris Peterson, Treasurer Jim Mac Donald, and Gretchen West selected Matthehw Jachowski in the senior division and Brandon Kanetani in the junior division as recipients of awards from our club.

NASA is looking for a few good educator astronauts. Qualified teachers are asked to apply.

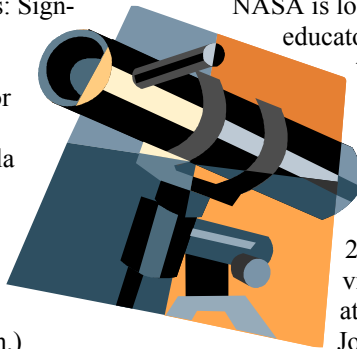
The University of Hawaii - Institute for Astronomy Open House is April 26, 2003. Interested individuals are urged to attend.

John Gallagher spoke about the recent Light Pollution Bill (SCR 626).

Mike Shannahan wanted to make us aware that on April 26th there will be a restationing of the International space station by two new astronauts, a Russian and American Astronaut Ed Lu. Mike also indicated that the Planetarium will be getting a bit of a face-lift. The Watamull Family has made a sizeable donation for the refurbishment of the Planetarium. New seating and carpeting are in the offing.

The meeting adjourned at 9:05 pm. for refreshments.

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



Alien Oceans. (Continued from page 1) suggest that Earthly life first got started around these vents.

So a warm European ocean spotted with thermal vents could be a natural incubator for life. That's why some scientists hope that someday we will send a probe to Europa that could bore through the ice and explore the ocean below like a submarine.

To plan for such a mission, scientists would first need to put a camera in orbit around Europa. By looking for places where water has welled up to fill the spindly cracks that riddle Europa's surface, scientists can estimate where the ice is thinnest—and thus easiest to bore through.

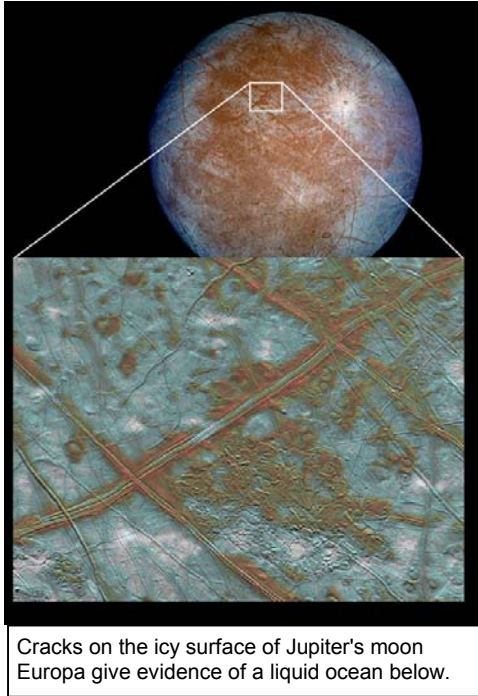
That mission scenario presents a problem, though. Europa orbits Jupiter inside the giant planet's punishing radiation belts. Continuous exposure to such high radiation would damage today's scientific cameras, making the information they gather less reliable and perhaps ruining them completely.

That's why NASA is designing a more radiation-tolerant CCD that could be used on a mapping mission to Europa. A CCD (short for "charge-coupled device") is a digital camera's

chip-like core, which converts light into electric signals.

"We've seen the effects of this radiation during the Galileo mission to Jupiter," says JPL's Andy Collins, principal investigator for the Planetary Imager Project. "Galileo has orbited Jupiter for many years, dipping inside the radiation belts only for brief intervals. Even so," he says, "we've seen clear signs of damage to its instruments."

By using the hardier CCD's developed by the Planetary Imager Project, a future probe could remain in Jupiter's radiation belts for many months, gathering the maps scientists will need to finally get a peek behind Europa's icy veil. And who knows, maybe there will be



Cracks on the icy surface of Jupiter's moon Europa give evidence of a liquid ocean below.

something peeking back!

To learn more about the Galileo mission to the Jupiter system, visit <http://www.jpl.nasa.gov/galileo/>. For children, a fun, interactive *Pixel This!* game at http://spaceplace.nasa.gov/p_imager/pixel_this.htm introduces CCDs and how a tough one will be needed for a future mission to Europa.

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

May Meteor Log

by Mike Morrow

May, like February, can bring more sporadic fireballs than usual, but the main event is the Lyrids.

Tuesday, May 22nd the Lyrids.
(Radiant 18h04m +34°)

The average rate for this shower is about 18 meteors per hour. This years maximum is at 22 hours UT or noon Hawaii time. It may be best to

look in the early evening before Moon rise. Lyrids are swift and occasionally spectacularly bright with some leaving persistent glowing trains.

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

School Star Parties

It's almost the end for School Star Parties, which are being coordinated by Forrest Luke. If you are contacted for a school star party, please have the school contact Forrest directly at 623-9830 or <lukef003@hawaii.rr.com>.

As a reminder, upcoming scheduled school star parties are:

7 May 2003 Mauka Lani (Makakilo)

8 May 2003 Webbling Elementary School

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.

Letters to the Editor

Tsutomu Seki (well-known for his discovery of Comet Ikeya-Seki) has launched his website in English. Seki has been an inspirational figure in amateur community in Japan for many decades, but many observers outside Japan may think he is no longer active in observing, as his name is not often associated with recent discoveries. I hope his website will change this soon.

He is very active still at the age of 72. He observers literally from dusk to dawn on every clear night, engaging in astrometric measurements of comets and asteroids, And has discovered so many new asteroids. Believe it or not, he regularly swims 1000 meters and is

a regular entrant in the Japanese Masters Games! His website provides not only his observation results but Seki's inner feelings and philosophy about observing and his life. Very interesting reading, indeed.

His English website is only a fraction of the Japanese version, but is being built up quickly. The website is at: [http:// www.comet-web.net/~tsutomu-seki/](http://www.comet-web.net/~tsutomu-seki/)

I hope your members have a look at it and give Mr.Seki or me their comments.

Kind regards,
Eiji Kato
Gold Coast, Queensland, Australia
e-mail: twin-star@bigpond.com

Binocular Viewers

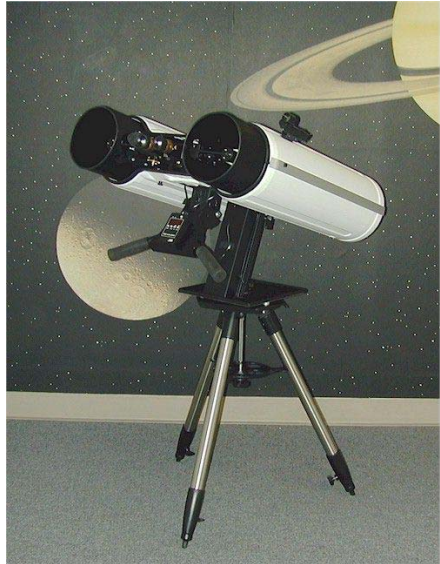
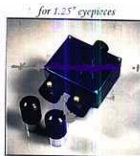
by Ron Paul Smith

Astronomers have two eyes, like most everyone else, but you would never know it by the huge number of single-tube telescopes sold throughout the world. The stated advantage of using only one eye to observe is that it causes the observer to really concentrate on seeing the object. Of course, the real reason is that it only costs half as much as a binocular telescope.

Binocular telescopes are available: ORION offers an 80mm (i.e., 160mm) twin-tube scope for about \$900. JMI offers a new 6" (i.e., 12") reflecting type binocular telescope for \$3,995. The view through a true binocular telescope is breathtaking, even though real "stereo" effect on stellar objects is not possible due to distance and parallax problems. But the same is not to be said in viewing the relatively nearby Moon. It's there, in 3-D stereo relief!

Another viable instrument is the binocular viewer. Prisms split the incoming light cone of the single OTA (optical tube assembly) in the viewing unit into two (usually user supplied) eyepieces. Some of these viewers cost more than the ORION binocular telescope itself! More often, the cost of viewer is between \$500-700 (plus eyepieces).

I purchased a very different type of binocular (twin eyepieces, one optical tube) from Seven Wonders, a Michigan concern. It consists of first surface mirrors and a beam splitter to direct the light cone to the eyepieces. The unit (minus eyepieces) is a bargain at \$200. Like most



JMI RB-66 Reverse Binoculars

viewers, it requires a 2x Barlow lens to achieve focus on most refractors, a nuisance when low power full field observing is desired. The manufacturer is currently working on a "corrector lens" to overcome this problem.

The authors of the excellent *Backyard Astronomers Guide* book, state that, "looking through a telescope equipped with a binocular viewer is an impressive sight. Objects appear to float in three dimensional space. Planets seem to take on extra detail. The Moon looks like a real landscape, just outside your spaceship window."

I concur. Need I say anything more about using "2 eyes to see 3 dimensions?"

JMI: <http://www.jmimobile.com>
ORION: <http://www.telescope.com>
Seven Wonders: 800-569-6633

The Star Spectroscope

by Ron Paul Smith

The father of stellar spectroscopy was Josef von Fraunhofer (1787-1826). He was an optician who created the spectrometer to measure the dispersive power of lenses. But the reader will likely know him best as the inventor of the German equatorial mount.

I recently purchased a star spectroscope from Rainbow Optics in Hayward CA. It consists of a blazed grating in a 1.25" filter cell, and a cylinder lens mounted in a rotating bezel. The lens holder is mounted atop the (user supplied) eyepiece. My unit is designed for photo/visual/CCD use. A less costly unit, with both elements mounted together, is available for visual use only.

These prisms are advertised as being, "able to reveal the hydrogen lines in Vega's spectrum, and the molecular bands of Betelgeuse"(followed by an excerpt from a review in Sky & Tel 10/95) ... "does what it claims to do and more."

It does work as claimed; when the observer looks into the eyepiece, he or she sees the star, and a set of colorful needle-like rainbow spectra on either side of the star, followed by trains of decreasingly dim spectra. The nearest and brightest spectrum is called the First Order, followed by the Second and Third Orders, et.al.



Moving the star to the edge of the eyepiece field, allows the observer to concentrate on the First Order spectrum. Rotating the cylinder lens bezel broadens the spectrum in width, letting the viewer see the black absorption lines, and whitish-color hued emission bands of the star.

There is a deal more to the study of stellar spectroscopy and spectroscopes and spectrometers, which I will cover in a future "show and tell," but it is vitally important to point out that astronomical spectroscopy is one of the few areas in which amateurs may contribute to professional astronomy. Relatively few amateurs are engaged in it, which is a mystery to me* since observing the stellar spectra is a very colorful avocation.

Also, scanning the sky with a telescope (or by simply hand holding the blazed grating), the observer can easily detect planetary nebulae, since they don't give off any spectrum.



* Note: I may have an idea why amateur astronomical spectroscopy is not widely studied: the new QMAX™ color spectrometer made to be used with the Questar line of telescopes costs more than \$4,000! On the other hand, holographic grating (sheets of translucent scissor-cuttable material) are available from Edmund Scientific for around \$10. All that is needed is a suitable cylinder lens, for around \$10-30, and the amateur observer can construct their own star spectroscope! Not as efficient and clear as the superior glass grating of the Rainbow Optics model (\$229), but it will indeed work.

The 46th Hawaii State Science And Engineering Fair recently concluded. HAS participated by selecting two excellent research projects considered to have a direct relationship to astronomy. Award recipients were provided with HAS membership, a certificate of achievement and a subscription to an astronomy magazine. Awards were presented by HAS Secretary, Gretchen West.

In the senior division **Matthew Jachowski's** project, ***Genetic Evolution of Initial Orbit Determination Error Models***, was unanimously chosen. Matthew developed a mathematical formula for the reduction of orbital errors of asteroids thus providing more accurate projections. Matthew is the Maui High School student chosen by HAS as last year's science fair winner.



In the junior division **Brandon Kanetani** of Iolani School created a project entitled ***Solar Electricity Collection Throughout the Day***. His project was designed to measure the effectiveness of solar panels to utilize the Sun's power in providing electric current at different times of the day.

Wanted: Equipment Reviews

Do you have a nifty new piece of astronomical equipment? Something spiffy like the Johnsonian equatorial tracking platform? Or the combina-

tion green laser, red/white flashlight? Or a binocular chair viewer? Even though we often have "show and tell" at our monthly meetings, many members are unable to attend. So please share your experiences with other readers of the Astronews.

Treasurer's Report

by Jim MacDonald

HAS Financial Report as of April 15, 2003

Initial Balance:	\$5,892.56
Receipts:	
Astronomy Payment	87.00
Donations	4.00
Dues Received	151.00
S&T Payment	29.95
T-Shirt Sales/Deposits	77.50
Other Income	26.40
Total Income:	\$385.85
Expenses:	
Astronews	155.27
Magazine Subscription Payment	286.57
Polo Shirt Payment	154.16
Science Fair Award	50.00
Refreshments	15.55
Bank Charge	22.75
Total Expenses:	\$530.14
Final Balance:	\$5,748.27

In the last month we had a family of four join the club. They are **Sapavith, Susan, Sarah, and Selena Vanapruks**. Welcome to the club and many thanks to the members renewing their membership during the month. We would also like to thank the Vanapruks family for their donation. Clear skies to all!

NOTICE!

HAS will publish a complete listing of Club members in the June 2003 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 May 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. *If you would like your e-mail address included, please let us know that, also.* Please be advised that this listing is intended **only** for Club members' personal use in contacting one another. HAS does not make this list available to, nor do we sell its contents to anyone for any purpose, and this information will **not** appear in the on-line version on the HAS web site.

Saturday evening, March 22, a group of club members decided to go to Dillingham for some viewing. While it was not a regularly-scheduled event, the moon would not rise until around midnight and that would provide plenty of dark skies. Then too, asteroid (704) Interamnia was scheduled to pass in front of a 6.7 magnitude star in Canis Minor at one minute past midnight for approximately 66 seconds. That would certainly add to the evening's interest.

Most of the folks in attendance were sharpening their Messier Marathon skills and the chatter between viewers was very interesting. You could hear everything from questions for help in identifying an object, to comments on what was being observed through an eyepiece, and, finally, words of joy at having located their quest. Of course, this would be followed by a pause while the item was checked off a list.

The skies were not that great clouds were blowing through periodically. When we did have a clear patch the seeing was decent. I think that most folks were ready to leave sometime after eleven o'clock, but decided to hold out for a look at the occulta-

tion. It was about that time that I decided to hunt down the patch of sky where the action was to take place. I was using my equatorially-mounted Newtonian so I would be able to track the area once it was located. With a wide-angle low-power eyepiece I was able to find stars 1 and 6 Canis Minoris, and there between them was the star to be occulted. In fact, this small patch of sky was naked-eye visible.

Minutes before the event we all took our place at our telescopes and started watching the target star. A couple of minutes before the occultation a cloud appeared and started to obscure that portion of the sky we were interested in. It got thicker and thicker although I could still see the target star. At some point the star disappeared from view. Had the occultation started or was the cloud now too thick? My timer was running and after several minutes it was obvious that the cloud was occulting the star and not just the asteroid. At that point, we all gave up. Like so many other astronomical events in Hawaii the weather has the last say on our success or failure.

Perhaps, next time we will be luckier.

Astro Quotable:

He, who through vast immensity can pierce,
Sees worlds on worlds comprise one universe,
Observes how system into system runs,
What other planets circle other suns, . . .
May tell why Heaven has made us as we are.

Alexander Pope, *English Poet* (1688-1744)

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Mars Rover—National Aeronautics and Space Administration