

the PIPELINE

Powered by the Natural Energy Laboratory of Hawaii Authority
Hawaii Ocean Science and Technology Park

Plans for
NELHA's 50th
Anniversary
Underway

Summer 2023
Volume 5, Issue 1

HATCH Accelerator 5.0 Officially Begins!

what's inside?

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Gearing Up for NELHA's 50th Anniversary

It's a milestone anniversary worth celebrating.

In 1974, ACT 236 of House Bill 3097-74 was approved to establish a State Natural Energy Laboratory.



Back then, Keahole Point wasn't anything but miles of vast and empty lava fields.

In the present day, HOST Park now has flourished with over 50 emerging renewable energy, aquaculture and ocean-based and sustainable technologies.

The accomplishments of the many entrepreneurs over the past five decades at HOST Park should be celebrated!

Preparations are underway as we plan to mark this historic 50th anniversary milestone in 2024.

As part of the celebration, we hope to offer an open house which can showcase the many wonderful businesses and organizations that make HOST Park.

Stay tuned for more details.

- Greg



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HOST Park - Powered by the Natural Energy Laboratory of Hawaii Authority

About NELHA

The mission of the Natural Energy of Hawaii Authority (NELHA) is to develop and diversify the Hawaii economy by providing resources and facilities for energy and ocean-related research, education, and commercial activities in an environmentally sound and culturally sensitive manner.

NELHA TEAM

Bryan Babbitt, Eng. Projects Coord.
Greg Barbour, Executive Director
Brian Berg, Utility Electrician
Chad Debina, Gen Labor
Faustine Edge, Administrative Asst.
Alex Leonard, Chief Projects Mgr.
Pam Madden, Water Quality Lab Mgr.
Bryce Matsuoka, Groundskeeper & Maint.
Steve Midgley, Electrician
Jerrae Miranda, Business Mgr.
Tony Mitchell, Maint. Mechanic
Rae Nguyen, Mktg. & Leasing Spc.
Keith Olson, Chief Ops & Science Ofc.
Jennifer Rasmussen, Acct. Clerk
Laurence Sombardier, Deputy Dir.
Kevin Tapley, Ind. Maint. Mechanic
Dean Towle, Ops. Supervisor & Eng.

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SOCIAL MEDIA!



launch day

HATCH Accelerator 5.0 Has Officially Begun!



Photo courtesy: Andrew Hara



READY, SET, GO! HATCH launched its Accelerator 5.0 program by introducing 10 companies selected out of several hundred applicants. They will participate in a rigorous program where they will be mentored by industry experts, gain experience, network with past alumni, and get friendly with private and institutional investors.

Ranging from aquaculture, alternative seafood and marine biotechnology, the cohort members traveled from around the world to participate in the three-month program starting in Kona where they were welcomed by the local community, beginning with a Hawaiian blessing.

Each company had a chance to talk about their background and their product.

The participants will travel to Norway, Vietnam and then Singapore for the final event.

HATCH is currently accepting applications for its Accelerator 6.0.

nelha.hawaii.gov

HATCH Accelerator 5.0 Cohort:



THE Crop Project



BRIDGING THE gap

Good Jobs Hawaii Garnered Tenant Participation

IN-DEMAND SKILLS NEEDED:

- MECHANICAL
- AQUACULTURE KNOWLEDGE
- GENERAL LAB



MEETING OF THE MINDS: Good Jobs Hawaii - a \$35 million workforce development initiative - is aiming to fill education gaps and provide support for internships and programs in select sectors including food security and ocean technology.

Last May, HOST Park clients and community members learned about Good Jobs and provided input on what skills are needed to meet their company objectives.

The program is a coalition of educators, businesses and community partners with UHCC leading the effort by offering no-cost skills training in high-demand industries including healthcare, technology, skilled trades, creative industries, and clean energy. Visit GoodJobsHawaii.org.



Tipping the TOWER

The Meteorological Station Needs Its Instruments Calibrated Every Two Years

IT'S GONNA BE A SUNNY DAY, FOLKS: Though it's perhaps one of the tallest, standalone apparatus at HOST Park, not everyone knows what it does.

NELHA's meteorological station which includes the actual tower, data logger, and sensors that read air temp, wind speed, humidity, barometric pressure, precipitation, UV and much more is the gizmo that companies like **Cyanotech**, **Big Island Abalone** and many others depend on for real-time and historical meteorological data.

Located just outside the Makai Research Campus entrance, the station's instruments need to be calibrated every two years to ensure consistent and accurate data. NELHA keeps two sets of instruments to minimize downtime and is easy to allow data download on demand.

Mahalo to the OPS team and our intern Dahan Choi who stood out in the sweltering heat to get it running.



NELHA Employee Tony Mitchell Receives DBEDT Service Award

A FEAT LIKE NO OTHER: It seemed like yesterday when Tony Mitchell started at NELHA as the maintenance mechanic back in 1991.

He has seen HOST Park's landscape change from lava fields to new businesses and innovation in a little over three decades since he's been here.

As part of operations, he's been in numerous projects, including upgrading and keeping the seawater pipes in working order.

Recognizing this amazing milestone, DBEDT has given Tony the Service Award for 30 years.

Executive Director Greg Barbour presented the award during a surprise party to celebrate Tony's hard work and dedication he has shown over the years.

But there's one thing Tony is looking forward to:
His retirement.

It might not be this year but he's thinking of the future and would like to dedicate more time to his 'ohana.

Congratulations Tony and thank you!

HOST

Sea Salts of Hawaii Goes Solar

HARNESSING THE SUN'S ENERGY: Did you know that the annual insolation at HOST Park is the same as the Arizona desert?

Cities like Phoenix and Tucson see an average of over 300 sunny days. Guess what? Kona also does too and one company is taking advantage of the constant sunny rays.

Sea Salts of Hawaii just finished their photovoltaic installation which will help offset the energy currently used for salt production.

The installation will generate 46.1 kW a day. That's akamai Sea Salts for thinking ahead.

Visit Sea Salts of Hawaii.

Blessing of Napoli Art Studio

THE PONO WAY: Last April, a blessing was held at **Napoli Art Studio** with dozens in attendance.

Artist Catherine di Napoli invited the local community to share the experience and learn more about her ocean view studio and abstract artwork.

A few of her pieces are adorn at the Westin Hapuna Prince Hotel and at Tiffany's Art Gallery in Hawi.

Her Verde and Unapologetic series can be found displayed in Hale 'Iako. Visit Napoli Art.



PARK

Happenings



Lawn Art at Big Island Abalone

ABALONE LOVE: Have you checked out the art on Big Island Abalone's lawn?

Heart-shaped decor made of pink abalone shells welcome hungry diners to Kona Barbeque.

Take a selfie before heading out to the food truck or barbeque.

Visit Kona Barbeque to find out what's on the menu.

Ke Kai Ola Revitalizes Native Plant Population

MALAMA 'ĀINA: Ke Kai Ola's conservation work does not stop at rehabilitating injured seals at their monk seal hospital at HOST Park.

They take great pride in their facility which has 17 native plants growing.

They have also observed both the endangered yellow face bee and Kamehameha Butterfly frequenting the plants that are important to their survival.



Photos courtesy of Ke Kai Ola

HATCH Pau Hana a Hit with HOST Park

IT'S PAU HANA TIME! HATCH held its quarterly pau hana filled with ono grinds, endless drinks and libations to a happy crowd last April.

In celebrating businesses and innovation, attendees were able to network and catch up on the latest industry and community news.

Just recently, their summer pau hana was a hit. The Accelerator 5.0 cohort was there to say their goodbyes before they head to Norway.

There's sure to be another pau hana in the future. Stay tuned!



Summer pau hana



connecting with the



Dylan Howell, HATCH's dealflow & operations manager, Americas talks to Mālama Loko Ea Foundation group seeking solutions to save their ancient Hawaiian fishponds in Oahu.



Mālama Loko Ea Foundation Seek New Tech Solutions to Restore Their 400-Year-Old Fishpond

BRIDGING THE OLD AND THE NEW:

HOST Park has always been popular with more requests for tours than can be accommodated. But we are very excited about our initiative to reach out to Loko I'a groups and practitioners.

Facilitated by SeaGrant and others, the connections are being made between groups that are working with traditional fishponds and some of HOST Park's innovative companies so that all groups can learn from and support each other.

Mālama Loko Ea came to talk story about their

foundation and to learn what new technologies are being used at various aquaculture businesses here at NELHA.

The foundation is currently in the process of restoring Loko Ea, a 400-year-old fishpond in Hale'iwa and is seeking solutions on how to keep optimal oxygen levels and reduce the high temperatures of their pond.

Mahalo **HATCH**, **Jamestown Seafood** and **Ocean Era** for accommodating and sharing your insight.

community



Waianae High School learn about HOST Park & tour around the facilities. Photos courtesy of Kai Fox.

Waianae High School Students Head to HOST Park

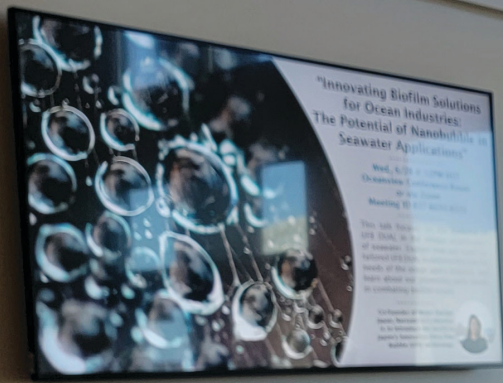
GOING ON A FIELD TRIP: It's a quick hop from Oahu for Waianae High as they tour the HOST Park research campus and journey to nearby facilities.

nelha.hawaii.gov

Students learn about what jobs are available in the blue economy.

Mahalo **Ocean Era** for obliging.

Hale 'Iako DIGITAL ANNOUNCEMENT BOARD



READ ALL ABOUT IT!

Have you noticed our new format for digital announcements in Hale Iako?

These announcements get rotated monthly and include time-sensitive items such as upcoming brown bag seminars.

We also highlight different HOST Park clients each month.

Do you have exciting news to share? Send it our way!

Email Rae if you have content you would like to contribute.

FOLLOW NELHA ON SOCIAL MEDIA!



LET'S CONNECT!

Did you know that NELHA is now on social media?

Yes, it's true!

It's a great way to connect and

get the latest updates and news on what's going on at HOST Park.

Subscribe and tell your friends to follow us on our various platforms so you don't miss out!



INSTAGRAM

nelha_808



LINKEDIN

NELHA



FACEBOOK

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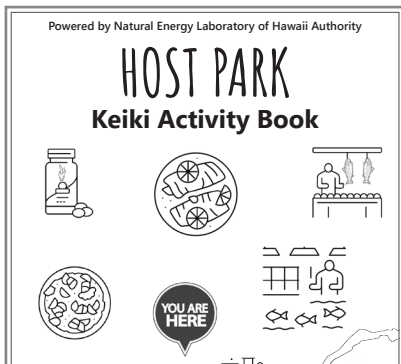
THREADS

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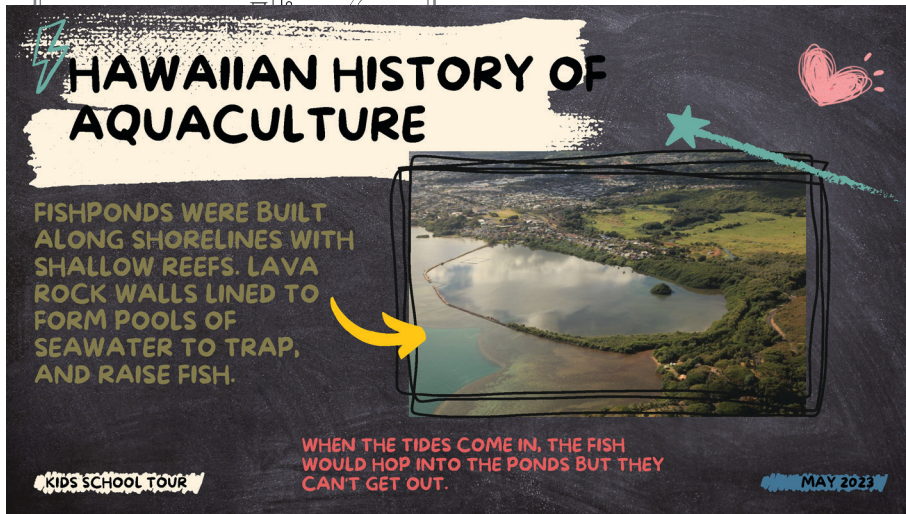
YOUTUBE

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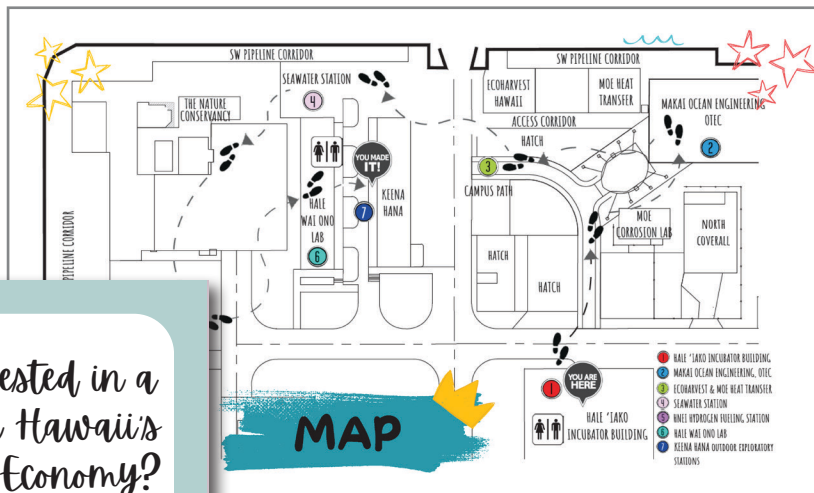
Educational OUTREACH

NELHA to Provide Field Trips at HOST Park



KEIKI CONNECTION: In an effort to engage with the local schools and educate the community about HOST Park, interactive field trips are offered beginning of the 2023-2024 academic year.

We have organized a comprehensive outreach program that includes informative presentations and walking tours of the research campus and nearby companies and organizations.



The younger group will get to join a mini scavenger hunt/sensory touch station after the tour with different items related to our ocean.

Kids won't go away empty-handed either. Younger keiki will get to take home a fun coloring activity booklet.

Older kids interested in jobs in marine technology and aquaculture will receive a brochure listing available internships and jobs.

Interested in a job in Hawaii's Blue Economy?

You're in luck! There are plenty of internships and jobs in renewable energy, aquaculture and ocean conservation on Hawaii Island.

Hawaii has various programs dedicated to assisting those interested in careers in ocean technology and conservation, food and energy security.



nelha.hawaii.gov



We have recently joined ClimbHI Bridge, an online portal that connects businesses, educators and students.

We look forward to sharing our love of the ocean, sustainability, and the fun, innovative work happening at HOST Park in these important areas with our Hawaii keiki.

HOST Park ANNOUNCEMENTS

Got News to Share
with HOST Park?

Let us know! Email
nelha@nelha.org

What to Expect for Ironman 2023



Ironman returns to a single race format on October 14, 2023 – but with a twist!

This year, Kona will host an all-female world championship race as it will be just one day, not two.

Professional and age groups from around the world will participate in the historic and iconic race which includes a

marathon through HOST Park.

The race will take place on a Saturday which should help keep disruptions to HOST Park clients to a minimum.

Keep an eye out for more information from NELHA staff as we get closer to the October race.

Larval Experts Meet Monthly

By: **Gerald Heslinga, Chairman**

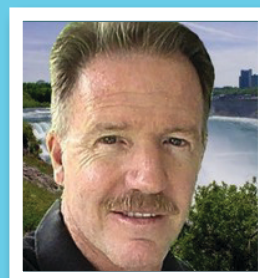
The Keahole Point Larval Group (KPLG) is a private industry association composed of NELHA-based hatchery managers, biologists, and company owners who work professionally with marine larvae.

While many companies at NELHA depend on successful larval production for their business survival, until recently there was no organized group or regular schedule of in-person meetings enabling larval biologists to share experiences and data.

Established in January 2023, the KPLG meets monthly to discuss issues of common interest and concern, especially factors that limit reliable

hatchery production.

We emphasize objectivity, rigorous questioning, hypotheses testing, and sound science. We collaborate with NELHA to help strengthen the entire Keahole Point business ecosystem.



KPLG is committed to the utmost respect for company privacy, proprietary technology, intellectual property, and sustainable practices.

Membership is by invitation. Send inquiries to Gerald Heslinga, KPLG Chairman
gerald.heslinga@gmail.com.

NELHA New Phone System Scheduled for Install



Hawaiian Telcom will be upgrading NELHA phone systems by the end of this month.

Each NELHA staff receive their own direct numbers.

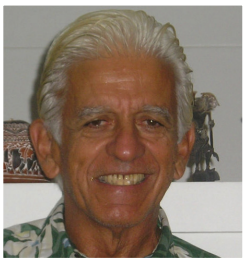
There will be no need to dial extensions if you want to reach the staff at NELHA.

Stay tuned for new contact information.

EXPLORING THE ARCHIVES:

OTEC Power Affected by Channel Eddies & Internal Waves *Between Maui and Hawaii Island*

By: Staff and Luis Vega, PhD



Something interesting happens in the 'Alenuihāhā Channel that separates Maui and Hawaii Island, affecting the waters off of Kona.

Dr. Luis Vega, who was a project manager for Pacific

International Center for High Technology Research Center back in 1993, connected changing seawater temperatures in Kona to the channel dynamics.

In strong winds and high seas, the 30-mile-wide channel - with a maximum depth of 1,859 meters - produces a significant funnel effect inducing variable currents resulting in eddies and associated water temperature variability.

The temperature signatures of the Alenuihāhā Channel eddies were measured by Vega and his team during the operation of a 250 kW Open-

Cycle-Ocean-Thermal-Energy-Conversion (OC-OTEC) plant.

Eddies are a circular movement of water, "a whirlpool," counter to the main current.

Figure A depicts the temperature of the ocean surface water off NELHA ranging between 25.5 and 27.5 °C due to the eddies resulting in changes in the power output (kW) by the OC-OTEC plant between 200 and 235 kW.

The OTEC power output is proportional to the square of the temperature difference between the warm (surface) and cold (600m depth in this case) waters. Mathematically, it is represented as $(\Delta T)^2$.

It must be noted that although not included

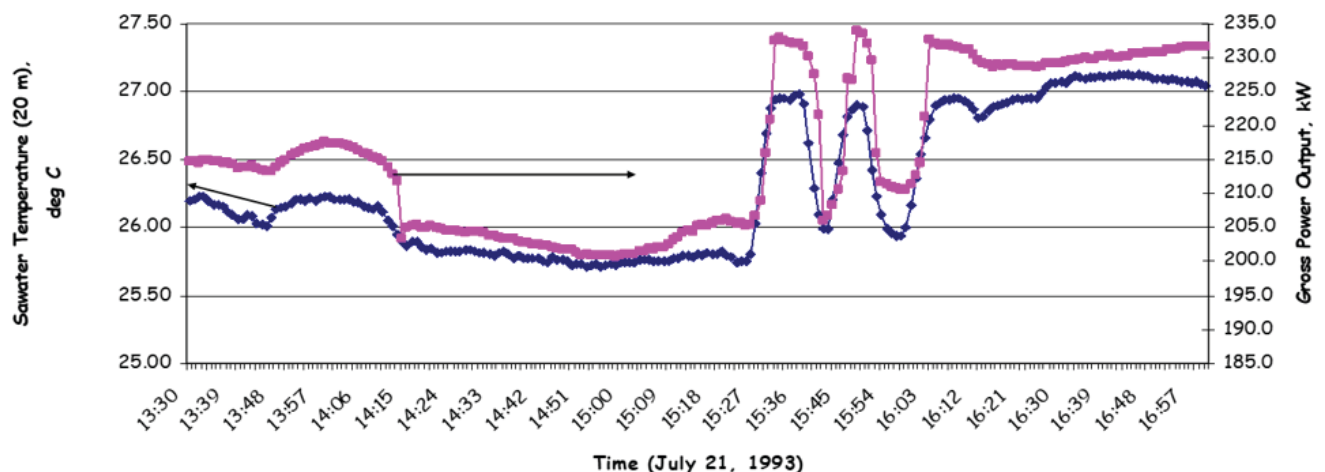
OTEC Power Affected

continued on page 14

Figure A

Eddy shed from the 'Alenuihāhā Channel (Hawaii)

OC-OTEC Power Output as a Function of Warm Water Temperature



OTEC Power Affected

continued from page 13

here, in this time-lapse, the deep ocean water temperature was essentially constant.

On another occasion, as depicted in Figure B, internal waves induced variations in the water temperature at 600m/2000ft. depth.

The colder the water source from 600m the higher the difference between surface and deep-water temperature resulting in higher power outputs.

The temperature difference (ΔT) between the warm surface water and the cold deep water is the OTEC fuel.

Vega's work confirmed expected power output variation based on thermodynamic analysis of OTEC plants.

However, the rapid variations of surface water temperatures induced by the eddies (by three - knot currents) forced the team to disconnect the cold water pipes.

High ocean currents pose a significant challenge to the design of mooring systems for OTEC.

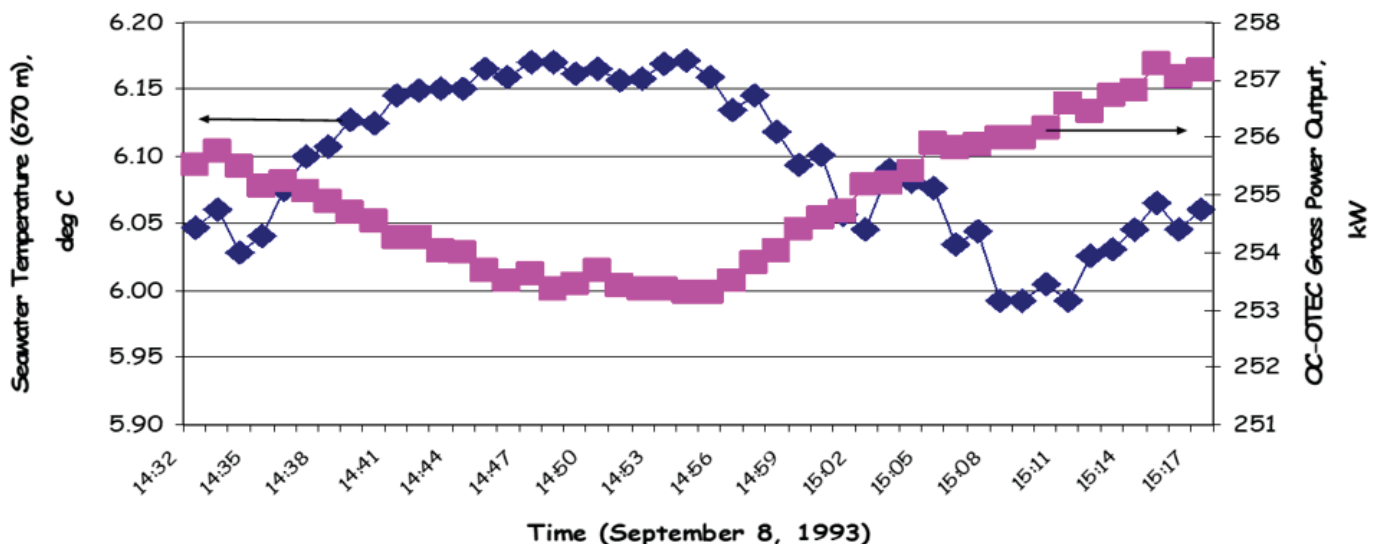
"Interestingly, local fishermen are familiar with the variable ocean currents off NELHA although they did not know the origin," said Dr. Vega.

For more information on OTECs, a TEDx talk featuring Dr. Vega is available on YouTube.

Figure B

Internal Wave 600 m Depth:
 $\lambda \sim 3,500\text{m}$; $P \sim 60$ minutes; $H \sim 50$ m)

Power Output as a Function of Cold Water Temperature



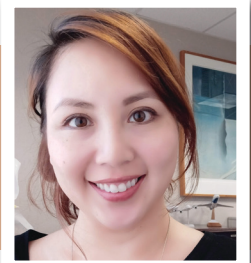
New Client and Faces at NELHA

Orion Space Solutions is our newest tenant at HOST Park. OSS designs, develops and deploys models, spacecrafts and sensors. They will capture data on trans-ionospheric disturbances using a receiver here at HOST Park. Visit Orion Space.



Meet **Bryce Matsuoka**, our new Groundskeeping and Facilities Maintenance Utility Worker. A dedicated and hard worker, he also worked at Merriman's and Pint + Jigger on Oahu. We're excited he's joined our team! Make sure to say aloha when you see him.

Have you met **Rae Nguyen**? She's our Marketing and Leasing Specialist. You might recognize her as she used to work at the Kona-Kohala Chamber of Commerce and Ellison Onizuka Kona International Airport. Say hi when you see her - she doesn't bite.



Meet the NELHA Interns



Korea West: **Da Han Choi**
Schooling: Chemical Engineer, Dongguk University, Republic of Korea
Internship Dates: April 1, 2023 – July 3, 2023
Project: Calibrate and Ground Truth NELHA's Seawater Flow Meters

Akamai Workforce Development: **Camry Gach**
Schooling: Engineering Sciences, Dartmouth College
Internship Dates: June 19, 2023 – August 4, 2023
Project: Seawater Distribution System Map and Infrastructure Database



Project Hokulani: **Evaline Krasovski** (left) & **Myla Tsuji** (right)
Schooling: High School (Interest in STEM Careers)
Internship Dates: July 11, 2023 – July 20, 2023
Project: WHEA Flow Meter Enclosure
& Communication Integration Project





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HOST park

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Research | Demonstration | Commercialization**

To inquire, contact:

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