



# Outreach & Education



## Students Shine Bright at 2018 Hawaii District Science & Engineering Fair

Local intermediate students present their projects to judges during the 2018 Hawaii District Science & Engineering Fair held at University of Hawaii at Hilo on Feb. 17.

Dozens of intermediate and high school students from across Hawaii Island presented their exemplary science projects during the 32<sup>nd</sup> annual Hawaii District Science and Engineering Fair on Saturday, Feb. 17. Held at University of Hawaii at Hilo, the event featured more than 100 projects exploring various challenges: everything from generating electric

currents using mud to outdoor solar ovens.

The event was judged by a group of local scientists, engineers and educators who spent the day reviewing projects and interviewing the students—30 of which will advance to the State Science and Engineering Fair on Oahu in March.

PISCES Geology Tech Kyla Defore volunteered as a judge and presented the PISCES Science Award to 7th grader Paul Varricatt of Hilo Intermediate School. Paul created a project on “Wireless Power Transfer” and used copper coils wound around iron cores to test the transmission of an electric current at a distance without traveling through wire.



Kyla interviews two intermediate students.

## Message From the Program Director



Rodrigo Romo

Aloha Kakou,

The State Legislative Session is now in full swing and PISCES is closely following several bills that could directly benefit the Agency. Senate Bill SB2751 is an administrative bill which aims to remove PISCES from under the Office of Aerospace Development (OAD) and place us as an independent agency in the Department of Business, Economic Development & Tourism (DBEDT). This would simplify the way PISCES conducts business from an administrative perspective. The bill also sets a ceiling for our special funds account which would allow us to accept supplemental funds from research grants and private contracts.

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## Hawaii Women in Astronomy 'Press for Progress'

Women in the Hawaii Island astronomy community gathered at 'Imiloa Astronomy Center to celebrate International Women's Day and honor their work supporting the Maunakea observatories.

The event was organized by EA Observatory/James Clerk Maxwell Telescope to form stronger ties among women in local astronomy organizations. Hawaii has more female astronomers than anywhere else in the world, according to Jessica Dempsey, deputy director of EAO/JCMT and a lead organizer for the event.

"Maunakea astronomy is an incredible home for innovation and meaningful work in clean, high-tech fields—full of opportunities for those

who are smart, driven and up to the challenge," said Dempsey during a keynote speech to attendees. "These women, assembled this evening, are examples of what is possible when intelligence and drive are combined with the willpower to change the face of a historically male-dominated industry."

Dempsey hopes the event will inspire more initiatives to energize and engage young women in the astronomy community, and the wider community.

"The future of Maunakea should be held in the hands of the young people of these islands," Dempsey said. "Half of these future leaders driving the cultural, scientific, spiritual and environmental preservation of this special place should be women."

## Program Director's Message cont..

The second bill, HB2557, was introduced by Rep. Cindy Evans. This bill aims to appropriate supplemental funding for our Workforce Development initiatives including our Summer Internship Program and Women's STARS program. We truly appreciate everyone who took the time to submit testimony on behalf of these bills supporting PISCES, and the lawmakers who continue to work hard in support of our projects and programs.

In other news, the selection committee for the Continuous Basalt Fiber feasibility study met last month to review proposals we received and select a bidder to complete the assessment. The study will determine if a CBF manufacturing operation on Hawaii Island could benefit the local economy. A contract is currently being drawn up and once it is complete, an announcement will be made on the selection.

Though we are still in the winter months, we are working hard to finalize and secure funding for the 2018 Women's STARS program coming up this summer. The program is now going into its fifth year, and we look forward to providing an improved experience for all the students based on what we've learned from previous summers. The week-long program will accommodate 12 local high school girls, exposing them to the working world of STEM and the women who work in it including local scientists, engineers and researchers in fields ranging from astronomy, geology, engineering and robotics.

A hui hou,  
Rodrigo Romo

## PISCES Helps Celebrate 'Imiloa's 13<sup>th</sup> Birthday



Above: PISCES Geology Tech Kyla Defore at 'Imiloa's 13<sup>th</sup> Birthday event. PISCES was among more than a dozen science, education and local business organizations who attended and supported 'Imiloa Astronomy Center's 13<sup>th</sup> birthday celebration. The free public event drew some 2,500 visitors, engaging the community with activities, demonstrations, food, prizes and entertainment. PISCES led a 'Mars Rover' exercise for visitors, as well as a UAV naming contest for the agency's new eight-rotor drone.



# Guest Spotlight

## Electronics Technology: An 'Industry-based' Approach

Bernard "Chip" Michels

*Electronics Technology Instructor, Hawaii Community College*

Electronics Technology—does that make you think of the days of CRTs, TV repairmen and the '80s? This is a problem here at Hawaii Community College. The curriculum was pretty much the same.

Being of an industry background myself, I took this gem in the rough and changed it to more of an industry-based program. Our focus lies in Telecommunications, Process and Controls, and Networking.

The program's first year is focused on the basics of electronics. Students learn basic calculations using Ohm's law to calculate variables in a circuit and how to apply trigonometry to phase angles. Electronic circuits like Motor Controllers, Oscillators, and frequency filters such as Band Pass, High, Low, and Notch types are constructed in the first semester. The initial semester also includes Digital Logic, challenging students to construct various circuits related to binary and hexadecimal applications. They also get a start on the Cisco Networking courses that are continuous throughout the two-year program. At this point, I take a slightly different direction than typical instructors. I like doing what I call "Destructive Instruction." In my approach, we calculate tolerances of a circuit and then push it until it breaks or burns up. The students learn to use

why calculations are important to the life of the circuit. The differences between carbon, silicon, and plastic is interesting and the students find it amusing.

During the second semester, we start building transistors circuits: OP Amp, A/D and D/A, Adders and even a seven-segment driver circuit. I introduce the students to sensors and we construct circuits around them. The second year includes courses like Telecommunications where we cover various types of modulation, Microwave site budget, wave propagation, antennas, troubleshooting and different types of distribution systems. Process and Controls are studied in the second year and second semester. Topics like SCADA, Wireless Ethernet, and integration of automation into a passive system are discussed and demonstrated. This really *is* automation for industry. No kids' toys either—we are using Siemens 1200 series PLCs (Programmable Logic Controllers) with 7" and 15" HMI (Human Machine Interface) displays. Students construct their own panels and are assigned a problem that would be industry-based.

This year's project involves automating a greenhouse for the college's Agriculture Department. Students will program, build, calibrate



*Boba Fett aka Bernard "Chip" Michels leads the Electronics Technology Program at HCC.*

and install the sensors. The goal of the course is to allow students to create a system of operation from computer to the field. This will provide the student with a feel for automation in industry. When the last semester is completed, our students are then able to take Cisco's CCNA testing here at the college for certification.

Opportunities for internships at Hawaii CC are growing thanks to companies like PISCES, Akamai and Hu Honua Power. I see the future as having more of these types of opportunities for our students to become future employees and entrepreneurs in Hawaii.

The goal for the Electronics Technology Program is to develop a technician with a basic understanding of how electronic components and systems work together and cultivating a skillset that will apply to most technology-based companies. We also need industry partners to participate and work with us in creating an ideal job applicant to meet their needs.

Once a year, our Advisory Council meets with industry representatives to get input for the direction of our program. Did I mention our Culinary Program provides the food?