



KapCC STEM Program
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KapCC STEM Program Newsletter (Vol. 1, Spring 2013)

The “Vomit Comet” Project

By Dr. Herve Collin, STEM Program faculty member and KapCC physics professor

About the Program

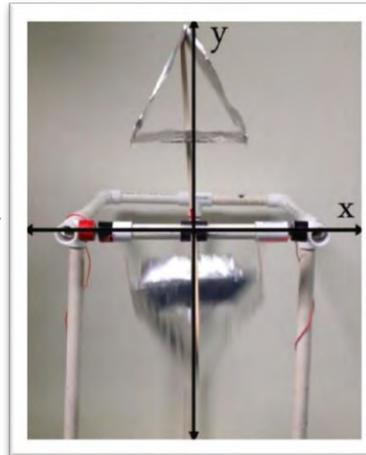
The goal of the STEM program is to enhance the quality of the science, technology, engineering and mathematics instructional and outreach programs at KapCC, as well as to increase the number of STEM students transferring to four-year degree programs as they prepare for careers in the STEM disciplines.

The program was started in August 2005 with a \$1.25 million Tribal Colleges and Universities Program (TCUP) grant from the National Science Foundation (NSF) for the development and implementation of the STEM program. Since that initial grant, additional grants have been awarded to the STEM Program, such as the \$500,000 Science Talent Enrichment Program (STEP) grant in 2007. These grants help the STEM Program to support students interested in pursuing degrees and careers in math and science.

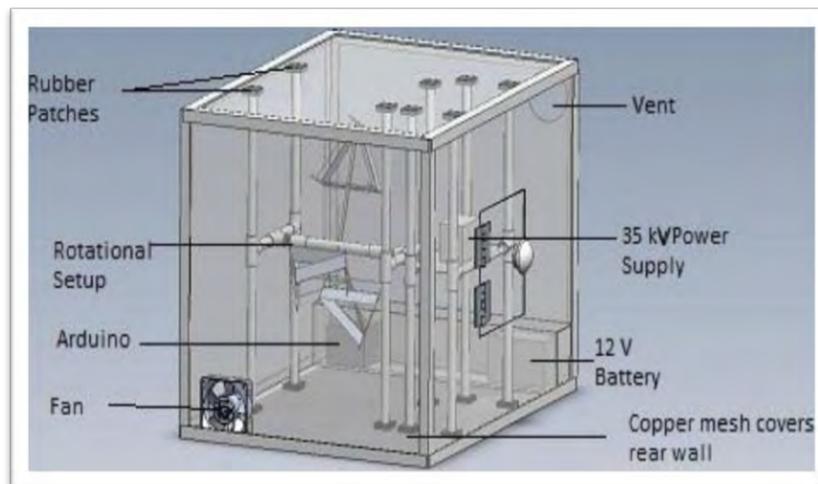
For more information, please visit the STEM Program website at <http://stem.kcc.hawaii.edu>.

STEM Program and KapCC students James Byner (team leader), Steven Ewers, Liem Nguyen, Holm Smidt, Rae-Zan Belen, and Lisa Kotowski (Physics Department at UH Manoa) have recently submitted a full proposal to the National Aeronautics and Space Administration (NASA) for the Reduced Gravity Flight Program, also referred to as the “Vomit Comet Experiment,” for the summer of 2013. The goal of the program is to allow the students to conduct experiments in a zero gravity (0G’s) environment. As part of this program, the students must fly in an aircraft flying in parabolic pattern. This parabolic movement, which will provide thirty seconds of hyper-gravity (2G’s) and eighteen seconds of micro-gravity (0G’s), is what creates the zero gravity environment.

The STEM Program team of six students is planning to conduct an electro-kinetic experiment involving an asymmetric capacitor under very high voltage (30kV). This capacitor, also known as an “ionocraft,” produces a mysterious thrust force that is the possible source of numerous scientific speculations over the past twenty years. The KapCC STEM Program team will attempt to clarify some of these claims and demonstrate that this thrust force is unrelated to an anti-gravity effect related to the electromagnetic force, which has been cited as a possible source of thrust in the past. The students will do so by conducting their experiment in a rotating environment in 1, 0, and 2G’s! If their proposal is accepted, the team will take a ride on the “Vomit Comet” this coming summer.



The experiment in action



A model of the entire system that the STEM Program student team hopes to test on the “Vomit Comet”

The Fall 2012 Opportunity Expo

By Keoki Noji, STEM Program Marketing Coordinator

On November 15th, 2012, representatives from companies and organizations across the state gathered at KapCC for the third annual STEM Program Opportunity Expo. This yearly event is designed to promote career, degree, service, and internship opportunities available locally for students interested in STEM fields. The representatives were on hand to meet with KapCC students, share information on their respective organizations, and offer various opportunities that they had made available to all students. The Expo was a great opportunity for students to become more engaged both on and off campus.

For the 2012 Expo, we were fortunate enough to have many great organizations presenting, including the Blood Bank of Hawai‘i, Center for Microbial Oceanography: Research and Education (C-MORE)/UH Manoa, Centers for Ocean Sciences Education Excellence – Island Earth, College of Tropical Agriculture and Human Resources (CTAHR) at UH Manoa, Ecology Club at KapCC, Hawai‘i Conservation Alliance, Hawai‘i Institute of Marine Biology, Hawai‘i Space Grant Consortium, Hawaiian Electric Company, Health Promotion Team (with Life Foundation), Honolulu Rail Transit Project, KapCC Pre-Med Club, KapCC STEM Program, KapCC Library, Kupu, Maida Kamber Center Counselors, NAPIRE, Native Hawaiian Science Engineering Mentorship Program, Pacific Alliance, School of Ocean and Earth Science and Technology (SOEST) at UH Manoa, STEM Undergraduate Research, UH Marine Option Program, University of Hawaii at Hilo, and Veteran Affairs.

For more information on the 2012 Opportunity Expo, please visit the STEM Program website at <http://stem.kcc.hawaii.edu>. Pictures from the event can be viewed on the Official STEM Program Facebook Page at www.facebook.com/kccstem. We’d like to send a big mahalo to all of the organizations who contributed to the event, as well as the STEM Program students, KapCC faculty & staff members, and especially Ms. Nari Okui for organizing the event. We hope to continue hosting this event in the future and that would not be possible without the assistance of all of the people and groups mentioned above.



Representatives from the KapCC library gave a workshop to assist students with their research



The Hawaii Space Grant Consortium (HSGC) table at the 2012 STEM Program Opportunity Expo

ASNS and UH Mānoa

Thanks to a new agreement, students who receive the Associates in Science in Natural Science (ASNS) degree in pre-engineering will also receive automatic admission to the UH Manoa College of Engineering. The official announcement from the university can be found below. “Students who complete the ASNS in engineering at Kapi’olani Community College and Leeward Community College with a minimum GPA of 2.0 or higher will be admitted to the UHM College of Engineering as a transfer student. Students who complete the ASNS with a concentration in engineering will be eligible for the offer of automatic admission to the UHM College of Engineering in the semester they complete the ASNS degree. The University of Hawai‘i Office of the Executive Vice President for Academic Affairs/Provost will be responsible for including this degree into the automatic admission process.”



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2012 Opportunity Expo

By Diamond Tachera, KapCC STEM Program Student and Peer Mentor, and Keoki Noji, STEM Program Marketing Coordinator



Diamond Tachera

During the fall 2012 semester, the KapCC STEM Program, through the Tribal Colleges and Universities Program (TCUP) Ecological Ahupua'a Monitoring in Urban Polynesia (TEAMUP) grant, sponsored STEM Program student and peer mentor Diamond Tachera to travel to the Hakalau Wildlife Refuge on the island of Hawai'i. The TEAMUP grant, also known as HāKilo, focuses on the life sciences, such as botany and biology. Below is an excerpt from an essay, written by Diamond, sharing her experience at Hakalau.

"Working to restore the natural, native rainforest was one of the most rewarding yet challenging experiences I have ever taken part in. In just a few years, the forest can be ruined by disease or destruction, but it takes hundreds of years to restore that same forest. Even though I

won't be able to see the results in my lifetime, I was able to see baby koa trees survive a summer driven by drought and hopefully, because of my efforts, survive the frigid winter.

This semester at the Hakalau Wildlife Refuge, instead of planting trees, we put up screens in order to protect the prospering trees. We learned that every year, there is concern that the seedlings won't be able to survive the winters at an elevation of about seven thousand feet. When the sun rises in the East, the plants begin photosynthesis before the ground water has thawed. Because there is no water to allow the plant to go through photosynthesis, they basically suffocate and die. The shade screens that we put up around every plant were on the East facing side, which allowed the plants to stay in the shade until the ground thawed. This in turn allows the trees to properly go through photosynthesis and survive the winters.

As a Native Hawaiian, working outdoors in the environment of my ancestors and working with plants and animals of such historical importance changed my life. Every time I have the opportunity to visit Hakalau, I am exposed to different cultural and educational experiences that many others will never be able to share. The sound of the wind blowing through the koa and ohia trees as amakihi and i'iwi sing their songs from the tree tops while sitting in the middle of a forest that hasn't been traversed in years is an unimaginable feeling and I will cherish the opportunity I had for the rest of my life."

-Diamond Tachera

Diamond, who has been a standout student during her time here at KapCC, was recently accepted to the School of Ocean and Earth Science and Technology (SOEST) Global Environmental Science Program at UH Mānoa. We would like to congratulate Diamond on her acceptance, thank her for her hard work while with the STEM Program, and wish her the best of luck as she transfers to UH Mānoa.

Conferences and Competitions

STEM Program Undergraduate Researchers

STEM Program students Eric Caldwell and Matthew Rappeline complete the National Community College Aerospace Scholars (NCAS) Program

By Keoki Noji, STEM Program Marketing Coordinator, and Matthew Rappeline, STEM Program Student

From May 1st to May 3rd, STEM Program students Eric Caldwell and Matthew Rappeline participated in the National Community College Aerospace Scholars (NCAS) Program. Eric and Matthew were two of only a few students who were chosen from a pool of applicants from across the country to take part in the culminating three-day program at National Aeronautics and Space Administration's (NASA) Jet Propulsion Laboratory in Pasadena, California. Below is a description of the experience as summarized by Matthew, who also happened to place first overall with his team at the NCAS Program.

"The on-site portion of NCAS was a short, fast-paced look into NASA's design process. Selection to participate in the on-site portion was predicated on completion of a four-step submission process detailing a hypothetical rover mission to Mars. I attended the on-site program from May 1-3, 2012 at the Jet Propulsion Laboratory (JPL) in Pasadena, CA. The program starts the moment you arrive. The first night, there was a short introduction before splitting into our respective teams. There were four teams, we were on the red team, and each team was given a designated mentor from NASA. First, the teams chose a name, logo and leadership: 1) A project engineer (PE) who acts as the president, 2) a procurement manager (PM) who acts as the treasurer and 3) system specialists, which are akin to division managers. These positions had various responsibilities throughout the entire process. Each team was given a bucket of stock parts with an itemized component cost list from which the rover was to be built. The first night concluded with design ideas for the rover and making plans for the next day.

The bulk of the work occurred on the second day. There were two rover tests, two presentations and two budgets that had to be submitted over the next day and a half. This was basically a concentrated version of the original design process. The morning was allotted for the first presentation and rover test. Each team ran the course around mid-day and then presented the company name and organization, as well as a poster-board displaying the results from the initial rover test. Then there was time to amend the rover before the second and final rover course test was conducted that night. The remaining time was used to finalize the slides for the second presentation and to make sure the budget was correct.

The second presentation happened in-front of the entire program and was the culmination of three days of intense work. Each company presented their motto, logo, officers, budget and the product of their design process in only 5 minutes. I was the project engineer for the red team, so I participated in both presentations. Eating lunch while awaiting the verdict was filled with speculation and was probably the tensest part of the NCAS experience. Hearing 'red team' announced as the winner was the perfect end to the whole experience. The real strength of our team came from our infrastructure. Each member identified his/her own strengths and worked towards the same goals. This team sacrifice really accounted for the solid quality of the work. Working on a team of like-minded, motivated individuals was an ideal situation. When the winner was announced, our jubilation would make you think that we had just landed an actual rover on Mars, but it did show the program's success in capturing NASA's design process."

-Matthew Rappeline

For more information about NCAS, visit

http://www.nasa.gov/offices/education/programs/descriptions/National_Community_College_Aerospace_Scholars.html

Faculty/Staff News

Nari Okui, the STEM Program Undergraduate Research Coordinator, moved to the mainland at the end of the Fall 2012 semester to continue pursuing her post-graduate degree. Nari has been with the STEM Program since the very beginning. As a student, she was the very first person to receive the STEM Program's Associates in Science in Natural Science (ASNS) degree. Nari has also been an undergraduate researcher and a peer mentor with KapCC and the STEM Program. As a STEM Program staff member, Nari assisted with all undergraduate research related activities, organized various events throughout the year, managed the STEM Program database, and so much more. Nari is currently applying to medical schools and we wish her the best of luck. We would also like to thank Nari for her years of hard work and for everything she has done for the program and the college.