KapCC STEM Program Newsletter *(Vol. 2, Fall 2013)*

STEM Program CanSat Team Takes First Place!

By CanSat Faculty Mentor, Dr. Herve Collin, and Keoki Noji, STEM Program Marketing Coordinator

(From left to right) McClyde Gaborno, Kelsey Kawaguchi, Taylor Viti, Rae-Zan Belen, Logan Tamayo, Diamond Tachera, and Joshua Tamayo take a second to pose with their CanSat and award ribbon after taking first place at the International CanSat Competition

The Canister-Satellite (CanSat) competition is an international competition sponsored by the American Astronautical Society (AAS), the American Institute of Aeronautics and Astronautics (AIAA), and NASA. The competition offers participating student teams the opportunity to design, build, and launch their satellite in a space-related mission. Specifically, the mission simulates the delivery of a sensor payload to a planet's surface. For 8 months, the Kapiolani Community College (KapCC) STEM Program student CatSat Team designed a payload with specific sensors to measure various readings including positioning, atmospheric pressure, temperature, and acceleration. In addition, a telemetry system was required to transmit all of the information collected by the sensors continuously to a "Ground Control" station in real time. Also, as part of the competition, their satellite had to deploy at exactly 400 meters above ground and then descend at a specific rate. As if that wasn't difficult enough, the last aspect of the CanSat competition involved creating a compartment to hold an egg that had to descend safely and survive the impact upon touching down. If any portion of the launch and descent were not within the required limits as stated by the competition committee, points would be deducted from the team.

Long before arriving at the competition in Abilene, Texas, the students were hard at work preparing for the various stages of the CanSat competition process. First, a Preliminary Design Review (PDR), a 100-page document describing their design, was presented to judges from NASA at the end of January. Next, the students submitted and presented their Critical Design Review (CDR) in March, which summarized the progress in regards to the designing, building, and testing of their design. Finally, the students traveled to Texas for the final launch in June. During the launch, the payload was propelled in a rocket to an elevation of approximately 2,000 feet before ejecting and traveling safely back down to earth. After the launch, the students gave a final Post Flight Review (PFR), which included a complete analysis of all the telemetry data that was sent to the command center and gathered during the actual flight.

Throughout the life of the entire project, the students learned how to work in a team setting and were able to experience a complete engineering process. In order to complete the CanSat in time, the students broke down the entire project into smaller

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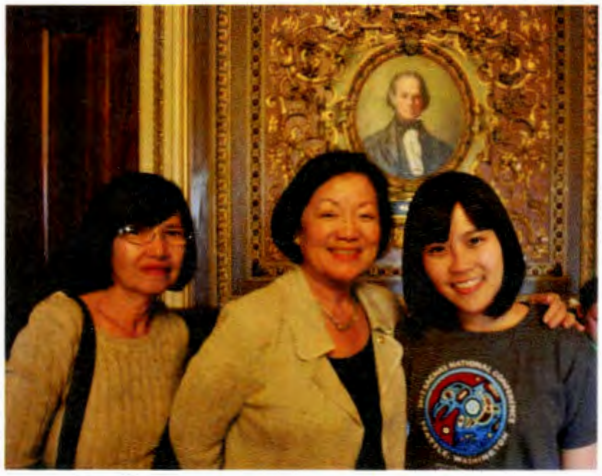
Jack Kent Cooke Foundation

Kapi'olani Community College STEM Program Student Awarded Prestigious Scholarship

By Keoki Noji, STEM Program Marketing Coordinator



(From left to right) Kapi'olani Community College Math & Sciences Department Chairperson Dr. Maria Bautista, Hawaii Democratic Senator Mazie Hirono, and STEM Program student and undergraduate researcher Micon Garvilles in Washington D.C. during the 2013 Community College Undergraduate Research Initiative (CCURI).

In April of 2013, it was announced that Kapi'olani Community College STEM Program student and Associates in Science in Natural Science (ASNS) major Micon Garvilles would be awarded one of the few Jack Kent Cooke Foundation Undergraduate Transfer Scholarship awards being handed out this year. The Transfer Scholarship, "which honors excellence by supporting outstanding community college students with financial need to transfer to and complete their bachelor's degrees at the nation's top four-year colleges and universities," is awarded to just 60 community college students every year. The scholarship is meant to cover a "significant share" of educational expenses including tuition, books, and living expenses. Micon is actually the second STEM Program student to win the Transfer Scholarship in as many years. STEM Program graduate Thuy Vy Luu was awarded the scholarship in 2012 and is now continuing her education at Columbia University in New York.

Micon has worked tirelessly to earn this award. In March of 2013, she, along with Math and Sciences Department Chair Dr. Maria Bautista, attended the Community College Undergraduate Research Initiative (CCURI) in Bathesda, Maryland. At the conference, Micon presented her research project, entitled "Estimation of N-myc DNA Copy-Number in Human Cancer Cell Lines via Real-Time Polymerase Chain Reaction," to other researchers, as well as professors and administrators, from colleges across the country. She and Dr. Bautista were also able to meet with Senator Hirono to discuss the importance of research at the undergraduate level.

During her time with the STEM Program, Micon has also participated in numerous STEM Program events, such as the STEM Undergraduate Research Fair (SURF), and has acted as a STEM Program peer mentor. Lastly, Micon recently won a national research poster award in biology at the 2013 Society for Advancement of Chicanos/Latinos and Native Americans in Science (SACNAS) Conference and was accepted to Columbia University where she will be continuing her education.

Congratulations Micon!

Revamped Website

Those who visit the STEM Program website regularly may have noticed a rather significant change in 2013. In an effort to improve continuity throughout KapCC, all KapCC related websites underwent a major facelift. For the STEM Program, the website content was moved from a platform called Joomla to a Wordpress platform. Although a lot of time and effort was required in order to complete the migration, the results have been very positive. First, all of KapCC's websites now have the same theme, which makes it easier for the reader to recognize the site as a KapCC related website. Second, the new layout is much simpler and more intuitive, which in turn leads to a more efficient and productive experience for the user. Lastly, the migration allowed us to filter through all of the content that had been available on the website for quite some time. In doing so, we were able to eliminate unneeded information and update the important aspects of the website. You can visit the website at http://stem.kapiolani.hawaii.edu.

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2013 STEM Undergraduate Research Fair

STEM Program Students Showcase Their Research at KapCC

By Keoki Noji, STEM Program Marketing Coordinator

STEM Program Undergraduate Researcher Holm Smidt displays his self-balancing robot at the 2013 SURF event

The STEM Undergraduate Research Fair (SURF) was created in order to showcase the undergraduate research work of STEM Program students. At the SURF event, the student researchers present their projects, which come from a wide variety of STEM disciplines. The event is a great practice opportunity for students who are presenting their findings at national conferences, such as the National Conference on Undergraduate Research (NCUR) at the University of Montana. The SURF event also gives other students on campus a chance to learn about undergraduate research and the STEM program in general. All KapCC students are welcome to attend the fair to learn about the benefits of research as an undergraduate and to learn about the various opportunities that are made available to them through the STEM Program. In addition, the fair is simply a great opportunity for all students to interact with current STEM Program member and learn something new.

The 2013 SURF event featured a wide array of research projects. For example, in the life sciences, STEM undergraduate researcher Melanie Keliipuleole, under the guidance of faculty mentor Dr. MacKenzie Manning, presented her research project entitled "Uncovering the Science Behind the Legend of Ka'au Crater's Red Spring," which analyzed the results of the water testing done in the crater. On the physical science side, STEM undergraduate researchers Lee Do, Arvin Niro, and Makana Ramos (faculty mentor Dr. Aaron Hanai) presented on their research project entitled "Implementing Intelligent Electronic Traction Control Systems in Robotic Platforms," which explained how a motor vehicle would be able to retain forward motion despite a loss of traction in one or more wheels. These are just two examples of the many different undergraduate research projects that were on display during the 2013 SURF.

We would also like to thank our guests from Kamehameha Schools and New York City College of Technology for attending the 2013 event and we hope to collaborate with both organizations again soon. The 2014 SURF will be held in the spring semester of 2014 and will feature a brand new batch of researchers and projects. Students interested in presenting their research at SURF 2014 can direct inquiries to kccstem@hawaii.edu. Once again, the 2014 event will be free and open to all students and visitors interested in viewing STEM related research. For more information about the SURF event and to view pictures and videos from past events, please visit the SURF page of the STEM Program website at http://stem.kapiolani.hawaii.edu/stem-undergraduate-research-fair-s-u-r-f/.

STEM Program Undergraduate Researcher James Bynes demonstrates his team's "lifter" device to KapCC students and faculty members visiting from the New York City College of Technology

2013 'IKE Summer Bridge Program

Future Engineers Prepare for College Careers at Kapi'olani Community College

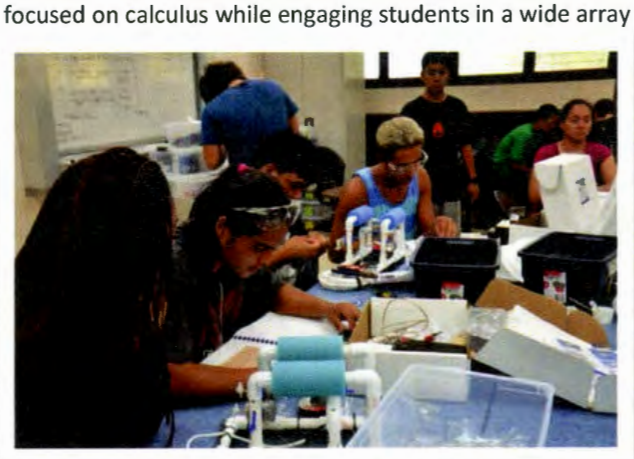
By Keoki Noji, STEM Program Marketing Coordinator

The 'IKE Summer Engineering Experiences (SEE's) are a sequence of summer programs that focus on supporting Native Hawaiian pre-engineering students across the University of Hawai'i System. Lead by Kapi'olani CC, the SEE's draw together students and staff from across six participating institutions: Kapi'olani CC, UH Mānoa, UH Maui College, Windward CC, Honolulu CC, and Leeward CC. All SEE's feature math courses and hands-on engineering projects, and all seek to explore the roles of engineering and innovation in Hawai'i's past, present, and future.

This year, the students enrolled in the 2013 'IKE SEE 1 held at KapCC were able to take part in many different engineering based activities. Students were able to learn about sound waves and woodworking while building electric guitars. At the conclusion of the six-week program, the students took home the guitars that they made themselves as a reward for all of their hard work. Each of the 'IKE students also built their own Underwater Remotely Operated Vehicles (UROV) during the Summer Bridge. The robot, called a SeaPerch, was originally developed by the Massachusetts Institute of Technology (MIT) as an inexpensive and efficient way to teach students about robotics and engineering. These are just two examples of the activities the students were able to experience.

In addition to the engineering projects, the SEE 1 students were put through strenuous math exercises every morning. The students focused mainly on their pre-calculus and trigonometry skills in an effort to prepare themselves for college level math courses.

While the 'IKE SEE 1 was comprised of recently graduated high school seniors, other SEE's were made available to future engineers who had already begun their college careers. The 'IKE SEE 2, which was hosted by UH Maui College, recruited students who had just completed their first year of college. SEE 2 focused on calculus while engaging students in a wide array of engineering projects and opportunities specific to Maui. Meanwhile, the 'IKE SEE 3, which was hosted by UH Mānoa, targets students who are preparing to transfer from two-year institutions to a four-year campus. These students, who are between their second and third years of college, take upper-division math courses and work in teams to design and complete an engineering project in a Renewable Energy and Island Sustainability internship.



Students enrolled in the 2013 'IKE SEE 1 work to assemble their SeaPerch underwater robots.

Student Accomplishments

Congratulations to STEM student Codi Wong! Every year, the Hawaii branch of the American Society for Microbiology (ASM) holds an annual conference. During the 2013 conference, Codi was given a travel award for the presentation she gave in the undergraduate division. Codi can use the financial reward to pay for travel to other conferences/workshops or for travel related to her research. Congratulations are also in order for Kapi'olani Community College undergraduate researcher Thomas Premeaux who contributed to Codi's research.

"The ASM is the oldest and largest single life science membership organization in the world. Membership has grown from 59 scientists in 1899 to more than 39,000 members today, with more than one third located outside the US. The members represent 26 disciplines of microbiological specialization plus a division for microbiology educators."

To learn more about the ASM, please visit www.asm.org.

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2013 HāKilo Summer Bridge Programs

Kapi'olani Community College Welcomes Life Science Students to Campus

By Keoki Noji, STEM Program Marketing Coordinator

HāKilo students work to complete their Hawaiian sleds in the Great Lawn of Kapi'olani Community College

HāKilo is a six-week summer experience for Kapi`olaniCC students interested in the life sciences including biology, ecology, and chemistry. HāKilo features math-intensive summer courses, hands-on `āina-focused investigations, and educational huaka`i. Each morning, students engage in an emporium-style math course taught by college instructors and assisted by student peer mentors. Each afternoon, students participate in faculty-guided research projects involving everything from medicinal plants to water quality testing to forensics. Applicants accepted into HāKilo are awarded a full scholarship that covers lunch, math course tuition, books, materials, and supplies. Students committed to the program improve their math abilities and build their skills through homework and exams. Upon successful completion, students earn valuable college credits and leave with a close-knit group of STEM peers, improved study skills, and a better understanding of O'ahu's ecology and the various life science career pathways.

Part of the goal of the HāKilo Summer Bridge Program is to make math and science more relevant to the students. One way this is done is by incorporating math and science with the culture of Hawaii. For example, on June 28th, the summer bridge students traveled to Turtle Bay on the North Shore of Oahu to participate in a Papahōlua event. During the event, the students, who had been working hard to construct Hawaiian sleds under the instruction of master craftsman Tom "Pohaku" Stone, were able to test and ride the sleds that they had made with their own hands. Throughout the entire sled building process which took several weeks, students learned woodworking skills while simultaneously learning about the cultural importance of the Hawaiian sleds. In addition, while building the sleds, KapCC instructor John Rader tied in math lessons to teach the students about various concepts including velocity, friction, and momentum. Not only did the students learn a great deal through the process, but the students had a great time testing their sleds at Turtle Bay and they were able to keep their handmade sleds to show to their family and friends.

Other activities that the HāKilo Summer Bridge students were able to participate in include fieldtrips to the Bishop Museum, the National Oceanic and Atmospheric Administration's (NOAA) Hawaii Undersea Research Lab, and the Makapu'u lookout. To learn more about HāKilo and all of the activities mentioned above, please visit the STEM Program website. For students interested in applying for the 2014 HāKilo Summer Bridge Programs, the applications will be made available online at the STEM Program website before the spring 2014 semester. Students who will be starting their first semester of college in the fall of 2014 should apply for the HāKilo 1 Bridge. Students who will be starting their second year of college in the fall of 2014 should apply for the 2014 HāKilo 2 Bridge.

STEM Program students, peer mentors, and faculty/staff members during the opening of the Papahōlua Event

Ms. Naomi Nihipali

Former STEM Program Student and Peer Mentor Returns as Full-Time Staff Member

By Keoki Noji, STEM Program Marketing Coordinator

STEM Program Undergraduate Research Coordinator Naomi Nihipali

The Kapi'olani Community College (KapCC) STEM Program would like to welcome back former student Ms. Naomi Nihipali. Naomi was recently hired as the new STEM Program Undergraduate Research Coordinator and Experimental Program to Stimulate Competitive Research (EPSCoR) Diversity and Education Workforce (DEW) Specialist. Although she is technically an employee of the University of Hawaii (UH) at Hilo, she has been assigned to KapCC as a full-time employee. Towards the end of the Fall 2012 semester, the former STEM Program Undergraduate Research Coordinator, Nari Okui, moved to California to pursue her graduate degree. Since her departure, the other STEM Program faculty/staff members, as well as the students and peer mentors, have worked hard to maintain the undergraduate research activities on campus. Thankfully, Naomi has been brought on board to organize and coordinate the activities.

Naomi is a former STEM Program student, peer mentor, and undergraduate researcher. Her research experience will serve her well as the new research coordinator. During her time as a student with the program, she participated in many research activities including the Emerging Researchers National (ERN) conference and the Quality Education for Minorities (QEM) conference. Below is a short message:

"Aloha all! My name is Naomi Nihipali. I grew up on the North Shore of O'ahu. I am a former Kapi'olani Community College STEM student. While a KapCC student, I had the opportunity to do research on Energy Balance with the STEM Program and faculty mentor professor Ronald Dunn. I was fortunate enough to experience an off-island internship through KapCC and also functioned as a Peer Mentor to my fellow students. I have a Bachelor of Science (BS) in Exercise and Sports Science from BYU-Hawaii. Over the past few years, I have worked in the Hawaii Department of Education system as a substitute teacher and have practiced as a Licensed Massage Therapist. If you could describe my personality in a few words, it would probably be passionate, detailed orientated and easy to humor."

-Naomi Nihipali

The STEM Program is thrilled to have a standout student return as an employee. Please join us in welcoming Naomi!

In the News

In the spring semester of 2013, the Kapi'olani Community College STEM Program once again participated in the annual National Conference on Undergraduate Researcher (NCUR). For the 2013 conference, the STEM Program sent two teams of STEM undergraduate researchers. Arvin Niro, Makana Ramos, and Lee Do (faculty advisor, Dr. Aaron Hanai) presented on "Implementing Intelligent Electronic Traction Control Systems in Robotic Platforms." Meanwhile, Michelle Chu and Roberto Ramilo (faculty advisor, Dr. Herve Collin) presented on "The Estimation of Daytime Sleepiness in Hawaii College Students Using Pupilometry." Congratulations to all of the students and faculty mentors on their terrific research.

"The mission of the Council on Undergraduate Research (CUR) is to support and promote high-quality undergraduate student-faculty collaborative research and scholarship."

To learn more about CUR and the NCUR conference, please visit www.cur.org.

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Biomedical Sciences & Health Disparities Symposium

STEM Program Students Takes Top Honor in Undergraduate Division

By Keoki Noji, STEM Program Marketing Coordinator

STEM Program student, peer mentor, and undergraduate researcher Robin Ka'ai

From April 8th to April 9th 2013, the John A. Burns School of Medicine (JABSOM) hosted the Biomedical Sciences and Health Disparities Symposium at the University of Hawaii (UH) at Manoa. The two-day symposium was designed as a "forum for students and mentors to learn about ongoing research in the biomedical sciences at the University of Hawaii." At the Symposium, current Kapi'olani Community College (KapCC) STEM Program student and Peer Mentor Robin Ka'ai, in conjunction with fellow KapCC undergraduate researcher Thoams Premeaux, presented on their research project entitled, "Use of Phage Display to Produce Antibodies Against *Campylobacter jejuni*." The research was carried out under the guidance of faculty mentors Dr. Matthew Tuthill, Mr. Alan Garcia, and Dr. John Berestecky.

At the conclusion of the Biomedical Sciences and Health Disparities Symposium, Robin was given the top award in the undergraduate division for his research and presentation. This was the first time a community college student had won an award at the Symposium, let alone the top honor. The award was well deserved, as Robin has worked hard during his time with the STEM Program. In addition to his duties as an undergraduate researcher, he has volunteered at numerous STEM Program related events, such as the annual Honolulu District Science Fair, and has served as a peer mentor in both biology and microbiology. Congratulations to Robin! For more information about the Symposium, please visit http://rmatrix2.jabsom.hawaii.edu/biomsymp/.

STEM Program Well Represented at Tester Symposium

Several STEM Students Invited to Albert L. Tester Memorial Symposium at UH Manoa

By Keoki Noji, STEM Program Marketing Coordinator

The University of Hawaii Albert L. Tester Memorial Symposium is held annually to highlight the work of biology students. Of the students who were invited to present at this year's symposium, seven are students who have come through the KapCC STEM Program. In addition to current STEM student Megan Onuma, students Malia Stewart, Scott Chulakote, Deena Gary, Daniel House, William Thomas, and Jason Alstad all presented at the 2013 symposium. This is not only a great accomplishment for each of the students individually, but also for the KapCC and the STEM Program as a whole. The strong showing at the symposium is anecdotal evidence that STEM Program students are successfully transferring to four-year institutions. In addition, it demonstrates that students who participate in undergraduate research early in their college careers are not only choosing to continue their research after transferring, but are excelling in research activities. The KapCC STEM Program has always stressed the importance of undergraduate research for both academic growth and the development of soft-skills, such as time management and public speaking. Congratulations to all of the students who were selected to present at the 2013 Albert L. Tester Memorial Symposium and thank you to the STEM Program faculty mentors and support staff who continue to support undergraduate at KapCC. To learn more about the symposium, please visit http://manoa.hawaii.edu/biology/?q=content/albert-l-tester-memorial-symposium.

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STEM Program CanSat Team *(continued)*

specific subsystems. The subsystem disciplines included programming, electronics, telemetry, physical layout, descent, and deployment. One particular challenge that was unique to this year's competition involved the descent team. In 2013, the competition committee decided to disallow passive descent mechanisms between the elevations of 0 meters to 400 meters, which led the STEM Program team to invent an active mechanism to control the descent of the device at a rate of 20 meters/second without a parachute. The 2013 STEM Program team designed the entire payload using Computer Aided Design (CAD) software, which was then printed using KapCC's 3D printer. These technologies helped the team to create a sturdy CanSat that was also relatively light in weight.

The STEM Program CanSat team was supported by the National Science Foundation and Space Grant Hawaii in collaboration with Windward Community College. We would like to congratulate the team for their hard work and their first place finish. We would also like to acknowledge team mentor Dr. Herve Collin for his guidance, all of the other STEM Program faculty/staff members and students who contributed to the effort, and the family and friends of the team members for their love and support.

(Clockwise from bottom left) Taylor Viti, Logan Tamayo, Rae-Zan Belen, Kelsey Kawaguchi, Joshua Tamayo, McClyde Gaborno, Faculty Mentor Dr. Herve Collin, and Diamond Tachera of the 2013 KapCC STEM Program CanSat Team at their ground control station before the launch of their CanSat.

About Us

The KapCC STEM Program Newsletter is your source for STEM related articles and information. The newsletter is published twice a year and features stories that highlight the achievements, such as awards and scholarships, of past and present STEM Program students. In addition, the STEM Program Newsletter will include updates on STEM related events and activities. The newsletter is available in hardcopy around KapCC campus and an electronic copy can be downloaded at the STEM Program website.

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.

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

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