Winter/Spring 2013 Vol. 37, No. 1 MESANEWS

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Industry joins MESA to train future STEM leaders

NDUSTRY JOINED FORCES with MESA to help a select group of over 150 college students hone their leadership skills at a conference in Sacramento last October.

The MESA Student Leadership Conference offered professional and leadership development through direct interaction with industry mentors and speakers. The hand-picked MESA students represented



See more photos on page 4.

Edison International: MESA Champion of 2012

EDISON INTERNATIONAL has been presented with the 2012 MESA Champion Award for the company's longstanding support of the program.

The MESA Champion Award was established in 2008 to recognize an individual, company or organization whose efforts have been exemplary in supporting MESA's mission to assist educationally disadvantaged students in California to prepare for college and STEM careers. Edison has awarded more than \$350,000 to MESA. That money has allowed both pre-college and university level students to succeed.

Edison International was a major sponsor of the MESA Student Leadership Conference (see story above). A \$40,000 grant from Edison benefited the entire conference and allowed 25 students from CSU Long Beach, CSU Los Angeles, UC Riverside, UC Santa Barbara, East Los Angeles College, El Camino College and Rio Hondo College to attend. Edison employees volunteered their time to work closely with the students during the conference, including a leadership workshop run by Tammy Tumbling, Edison International's Director of Philanthropy and Community Involvement.

California Public Utilities Commissioner Tim Simon, the 2008 MESA Champion Award recipient, presented Edison with this year's award.

Jose L. Perez, California Utilities Diversity Council chair, received the award in 2009 and the 2010 Champion was Pacific Gas and Electric President Christopher Johns.

31 universities and community colleges from across the state.

Pacific Gas and Electric and Edison International were major sponsors of the conference. Other sponsors were Southern California Gas Company, Vanir Construction Management, Inc., Lawrence Livermore National Lab, San Diego Gas & Electric and the Sacramento Municipal Utilities District.

> CONFERENCE Continued on page 4

Oracle and CMU's Alice mean Universe of Fun

IDDLE SCHOOL MESA students will learn three-dimensional programming using Carnegie Mellon University's Alice program, then put their skills to the test in an interactive game design competition sponsored by Oracle Academy, an initiative of the Oracle Corporation.

The Alice software provides an introduction to Java programming that teaches 3D animation and video game programming with an interactive interface and drag-and-drop technology. The software is named after Lewis Carroll's *Alice in Wonderland*, in which young Alice discovers a fantasy world.

Ten teams will be chosen to represent California MESA, competing against MESA teams from Maryland and Pennsylvania. Oracle Academy, which offers software and technology training to education institutions, provided all-day teacher training on Alice at workshops hosted by the Chapman and ORACLE / ALICE

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Solano students use engineering skills in Haiti

S IX SOLANO MESA students travelled to the village of Cherette in Haiti last July to use their engineering skills and help rebuild a dilapidated school. This is the third trip that Solano MESA students have made for the rebuilding project. The trips were organized by MESA director Mostafa Ghous and Solano College President and Haiti native Jowel Laguerre.

Student Arturo Castillo, a 26-year-old civil engineering major, has been to Haiti for all three trips and said he applied principles he learned in classes to the rebuilding project.

During the trips in 2011 and April 2012, the group researched construction procedures, took measurements, conducted surveying and selected a contractor. The students initiated construction during the latest trip and helped with breaking ground.

Castillo said being involved in MESA at Solano helped him develop leadership and team building skills, leading him to become involved in the Haiti project.

"Doing this volunteer work is an excellent experience. Not only do we work on constructing a school but we also are making a difference in the lives of countless children. This project was a once-in-a-lifetime opportunity and has helped me see the world from a totally different perspective," he said. ◆

MESA alum analyzes state policy using math, politics

ARTHA GUZMAN-ACEVES IS a MESA alumna and Gov. Jerry Brown's Deputy Legislative Secretary for Environment, Energy, Water and Agriculture. She was previously a legislative advocate for the California Rural Legal Assistance Foundation and has spent much of her career advocating for environmental justice and improving conditions for farming communities. Besides Guzman-Aceves, numerous legislative aides claim MESA as a starting point, and Assembly member Isadore Hall III and Democratic Caucus Chair Senator Kevin De Leon are former MESA students.

Guzman-Aceves was in MESA while in junior high school at St. Joseph's Elementary, then part of the California State University, Sacramento/University of California, Davis MESA center. She graduated from Georgetown University in 1999 with a degree in international economics and with a master's degree in agricultural and resource economics from University of California, Davis in 2002.

MESA asked Martha a few questions.

Q: How did you become involved with MESA?

A: My older sister, Sandra, started with MESA and I got involved through her.

Q: How did MESA help you in your educational path and career?

A: It was my first major exposure on how many career options existed in math and science, as well as how critical the sciences were as a base for everyday life management.

Q: What led you to focus on economics of agriculture?

A: I had an interest in math and politics and economics that was a perfect fit.

However, farmworker issues, including rural communities, have been a passion because of the great opportunities for improvement.

Q: Do you have a favorite MESA moment?

A: Yes. Being on a college campus for the first time was a powerful experience.

Q: What does MESA mean to you?

A: MESA is an opening to a bigger world that not every young person has at their disposal. MESA is literally opening a world of opportunity for each student that participates. ◆



Solano students review plans and break ground on school project. PHOTOS COURTESY MUSTAFA GHOUS

Students develop business solutions in competition

ESA STUDENTS HAD a rare opportunity to conduct competitive presentations in front of a panel of energy and utility industry leaders, and two Northern California teams claimed top prize.

The MESA Business Case Challenge tasked student teams to develop and present business solutions on the topic of "how to groom the next generation of leaders."

The contest was held during the MESA Student Leadership Conference held in October (see story, page 1).

Electrical engineering major Andrew Roby and mechanical engineering major Armando Ruezga of San Francisco State University were named the best four-year university team.

Justin LaGuardia, an electrical engineering major, and Nati Tessema, a computer science major from Cosumnes River College along with Shelton Tapley, Jr. a biomedical engineering major and Phuong Ngoc Lan Le from Sacramento City College were named the best community college team. Cosumnes River and Sacramento City colleges are both part of the Los Rios Community College District.

The Los Rios team proposed a non-profit organization geared toward strengthening workforce development by recruiting students to be involved in science, technology, engineering and math (STEM). They argued that industry partnerships with community colleges could establish customized degree and certificate programs that would cut



Los Rios Community College District Students accepted their awards.

corporate costs in initial training and development.

The San Francisco State team proposed a generational mentoring model in which college students majoring in STEM would mentor K–12 students, and industry professionals mentor college students.

Tammy Tumbling, Edison International's Director of Philanthropy and Community Involvement, and Raymond Stanford, Southern California Gas Company's Engineering Design Manager, judged. ◊



San Francisco State students were congratulated by industry officials.

GE Energy engineer got her start through MESA

Self-professed "math nerd" Veronica Salazar jokes that between participating in MESA

Days and leaving her small town to attend a MESA Northern California college tour, her career path in engineering was sealed.

Salazar is now a mechanical design engineer at General Electric Energy, and works on reactor tooling and testing for nuclear energy machinery in Bakersfield. She's been with the company for more than 10 years and

started there right after graduating from San Jose State University.

Salazar grew up in Arvin, a town of 13,000 residents about 30 miles outside of Bakersfield. While at Arvin High School, Salazar participated in MESA. She credits the program with helping her understand engineering and the careers available. She chose mechanical engineering to combine her interest in

math and science with her passion for art and design.

She's the first in her family to go to col-

lege with her parents a nurse assistant and a mechanical foreman supporting her decision to attend college away from home.

At San Jose State, Salazar benefitted from MESA again. The network of support in the MESA undergraduate program on campus helped her succeed as a mechanical engineering major.

"Going to school in a

large city was definitely a culture shock, so MESA helped by connecting me with students with the same interest and same backgrounds," the 2002 graduate said.

Now she and other GE employees volunteer to judge at MESA Days. She encourages the middle and high school students to follow their interest in math and science and become the next generation's engineers. ◆

CENTRAI

Alum takes charge of Central Valley high speed rail



IANA GOMEZ is a MESA alumna from California State University, Fresno and is now the Central Valley Regional Director for the California High Speed Rail Authority. The position is appointed by the governor and puts her in charge of the rail project from Fresno to Bakersfield. She previously spent more than 24 years with Caltrans as Senior Transportation Electrical Engineer, Chief of the Office of Traffic Management and Deputy District Director of Operations in Los Angeles District 7.

Gomez earned a Bachelors of Science desgree in electrical engineering in 1988 and has been the national president of the Society of Hispanic Professional Engineers.

Gomez spoke to MESA students at the Student Leadership Conference in October about her achievements and her time in MESA. She also sat down with MESA for an interview.

Q: What does MESA mean to you?

A: When you ask my mom what I do, she cannot tell you. She knows I'm an engineer, but she wouldn't be able to explain it. There was no way anyone in my family could encourage me to go into engineering, but MESA does that for students like me. That's what I think when I think about MESA. It's just that extra helping hand you wouldn't have had when you go to school.

Q: What are some of the elements of MESA that helped you most in your career path?

A: The networking and the teambuilding. I'm still a very shy person, but one thing about MESA was that it helped me get out of my comfort zone; it forced me to get out there and network. It put me in these competitions and got me working with teams. When you're in the work world everything is about working in teams and you get an early understanding of that in MESA.

Q: You grew up in the small town of Parlier, CA. How has getting a degree and being so successful affected your community?

A: I never thought growing up that I'd be a role model, but I am. I think it gives people hope. I was an average student. I wasn't the valedictorian, I wasn't the salutatorian, I was a regular kid, who happened to be good at something, which was math. So my family and my community can see what I was able to achieve and take hope in that they can too. So now no one from Parlier can say just because they are from this small town they can't be someone and do something.

Q: What kind of relationships did you build while in MESA?

A: The people I met at Fresno in MESA are still my friends today. I used to work with some of them (at Caltrans) and it was great because we supported each other in the real world just like we did in college.

Q: Favorite MESA memories?

A: Being in the MESA center, all of us in a room during finals. Studying, not studying, just helping each other out with the stress. I also loved when we went on van trips to visit companies. I hadn't travelled out of my area much at all and having those experiences was all possible because of MESA. ◆

CONFERENCE Continued from page 1

State Superintendent of Public Instruction Tom Torlakson encouraged students to continue their STEM education. California Community Colleges Vice Chancellor Barry Russell also greeted the participants.



Corporate volunteers held mock interviews to help students improve resume writing and interview skills. They also led workshops and served as mentors during the two-day event. A "Women in STEM" panel discussion included representatives from AT&T and Intel, while former NASA astronaut Tammy Jernigan gave the keynote address. Diana Gomez, Central Valley regional director for the High Speed Rail and former district director of Caltrans, also spoke to the group. (See story, at left)

A panel of energy and utility industry leaders judged the MESA Business Case Challenge in which student teams developed and presented business solutions. (See story, page three)

Students attended from CSU Chico, CSU Fresno, CSU Long Beach, CSU Los Angeles, CSU Sacramento, San Diego State, San Francisco State, San Jose State, Sonoma State, UC Riverside, UC Santa Barbara, UC Santa Cruz, University of the Pacific, American River, Butte, Cañada, City College of San Francisco, Cosumnes River, East Los Angeles, El Camino, Los Medanos, Mission, Napa Valley, Rio Hondo, Sacramento City, San Diego City, San Joaquin Delta, Santa

Rosa Junior, Skyline, Southwestern, and Yuba Colleges. ◊



Students enjoy a conference dinner (left). State Superintendent of Public Instruction Tom Torlakson addressed students (right). PHOTOS JESUS BAROT

Transfer student headed to finish line at UCLA

WENTY-THREE-YEAR-OLD ROBOTICS engineering major Eloy Salinas was a busy man at Santa Rosa Junior College. He took the prerequisite courses he needed to transfer plus upper level classes.

So when he transfered to UC Santa Cruz in fall, 2012, MESA Director Lydia Zendejas said he was ready to tackle anything.

"This is not something we see too often some students may not have taken computer assembly or discrete math," Zendejas said. "The MESA program gave him the tools to be better prepared for transfer than a non-MESA student. "

While at Santa Rosa Junior College, Salinas said the MESA study center gave him a place to interact with like-minded people.

"The students I met there are now lifelong friends," he said. "Beyond that, the tutoring and internship, scholarship, and volunteering opportunities were amazing."

Salinas chose Santa Cruz for the new robotics program at the Jack Baskin School of Engineering and to continue in the MESA program on campus. Santa Cruz is the first UC campus to offer a bachelor's degree in robotics. He intends to minor in astrophysics and hopes to work for NASA with space rovers that explore space and other planets.

For Salinas, who is the first in his family to attend college, MESA made his transition easier. While at Santa Rosa he received help with the transfer process and financial aid, topics his family had no experience with.

"All the effort that (MESA staff) had me put into my schoolwork really shows here at Santa Cruz. I feel comfortable seeking help, studying in groups and approaching people," he said. "I have better study skills and I'm more active in school activities now due to the great events MESA has at Santa Rosa. Overall MESA proved invaluable to my transfer and transition success."

Like Salinas, most MESA community college students transfer to University of California campuses. The top destinations are: Davis, Berkeley, Santa Cruz, Los Angeles, and Cal Poly, San Luis Obispo. ◆

MESA mousetrap was engineer's first project

A control the says his professional path started much earlier.

The 24-year-old PG&E associate engineer said his interpersonal, problemsolving and technical skills were developed at Commodore Middle School while working on MESA Day projects.

"MESA was my start professionally," he said. "The competitions made me develop a lot of skills early, like the ability to ask the right questions and develop procedures to get the answers. As a team we had to work through personality conflicts, which we all know is a necessary job skill."

Baldwin also competed in MESA Days while at Stagg High School, which is served by the University of the Pacific MESA Center. In 2006 his mousetrap car team won the national championship.

"It was such an adrenaline buzz," he said. "The whole thing was pretty stressful—it was basically one 18-month project—but well worth it."

Baldwin said his MESA advisor, Andrew Walter, pushed his team to succeed and taught him valuable lessons.

"Mr. Walter is all in it for the kids. He was always there for us. At

Baldwin with mousetrap team members during 2006 competition (above right). Baldwin checking pipeline equipment as a PG&E engineer (right). nationals he went above and beyond, staying up late, picking up supplies, driving us everywhere. He was very supportive."

The nationals win led to a summer internship with AT&T. The company had donated to MESA and asked the winning team to speak to executives. the team members told their stories and even gave a demo of their mousetrap car.

"We ran the car right down their long meeting table," he said. "The executives loved it and asked us all to come work for them in the summer."

At PG&E, Baldwin works on the pipeline safety enhancement program in which he engineers the automation of valves so they can be shut off remotely. Baldwin started the job right after he graduated from California Polytechnic State University, San Luis Obispo, in 2010 with a degree in mechanical engineering. ◆





<u>SOUTHERN</u>

UC student selected for NASA Education Program

USTIN BAUTISTA has never allowed hardships in life hinder his progress or impede his goals.

The fourth-year electrical engineering major at University of California, Riverside Bourns College of Engineering grew up in a rough area. Bautista said living in the city of South Gate, located between East Los Angeles and Compton, his peers were often not interested in education.

"I definitely saw my run of gang members and gang activity," he said. "When I think back, most of my friends from the neighborhood aren't doing anything with their lives now. I'm one of the few people doing something productive."

Bautista said although his parents tried their best to shield him from the violence, he realized it was beyond their control when he and his father were robbed at gunpoint while Bautista was in high school.

Finances were also an issue for Bautista. His parents, a police dispatcher and cement worker, couldn't afford to send him to college, so Bautista took out loans and worked three jobs along with a full course load.

While at Riverside, Bautista found MESA. He said the undergraduate MESA

program helped him succeed in the classroom, but being involved with the precollege program gave him a passion for helping youth.

"I helped with MESA Days on campus and was thrilled to see middle and high school students excited about STEM," he said. "It made me want to do better for not just myself, but for them also."

Bautista said a contact he made at a conference he attended through MESA led to a selection in the NASA Cooperative Education Program. Through the program, Bautista alternates between semesters working at NASA and attending school. He has worked at the missions operation directorate and engineering directorate at the Johnson Space Center in Houston. He will complete his final rotation for NASA this summer in hopes of a full-time job offer after he graduates in 2014.

He'll continue to help at MESA Days and credits Riverside MESA director Jun Wang in helping with his success. "He pushed me to do scholarship that led to connecting with NASA," he said. "For me, he's a shining star and a silent hero in my life. Because of him, I'm where I am now."







Cervantes held several jobs to pay for her college degree.

Hard worker on the right track

IRIAM CERVANTES knows that hard work and determination pay off.

While a student at California State University, Chico, Cervantes held down three jobs and a full course load. Her grades weren't as good as she would have liked, but after taking a MESA calculus bootcamp and changing her major from civil to mechanical engineering, she got on the right track.

"There were a lot of stressful moments for me, but I got a lot of support from the MESA staff to help me through it," the 32-year-old said.

Cervantes, who is the first in her family to go to college, now designs heat transfer equipment used to safely dispose of oil refinery waste for the engineering company Fluor. She's always been interested in math and science and enjoys understanding the mechanics of moving parts. Her favorite class at Chico State was thermodynamics, which is a key element of the work she now does.

To help pay her way through college she worked as a MESA tutor and a waitress and helped her father in his drywalling business on the weekends. She later received a scholarship through MESA that also helped with her college expenses. The bootcamp allowed her to form study groups, and as an introvert, helped her connect with other engineering students.

"MESA means a lot to me," she said. "It was definitely a great support educationally, financially and emotionally." ◊

Engineering boot camp gets rave reviews

S AN DIEGO MESA community college students were given a boot camp course in research thanks to a collaborative effort between the California Space Grant Consortium (CSGC) and several San Diego-area institutes of higher learning.

The Research Academy provides engineering research exposure and hands-on experience to underrepresented students. Funded by the CSGC—a NASA-sponsored program—the one-week academy allowed 10 San Diego City College MESA students and 10 Southwestern College MESA students to work with graduate students on research projects. In addition to workshops on the research process and ways to give a research presentation, teams of community college students shadowed graduate students doing research at San Diego State University, the University of California, San Diego and the University of San Diego. The teams had to make a one hour presentation on the investigations they did during shadowing. They were evaluated at the conclusion of the academy.

Some of the projects included near-space balloons, a sensory motor prosthetic hand and the dynamics of flame spread in microgravity. The community college students also shared their experiences last fall semester

MESA grad still ahead of the technology curve

RMANDO SANTANA IS a pioneer of sorts in the multimedia world. He became a nationally known figure in the field of multimedia research when he was just an 18-year-old computer engineering student at the University of Southern California. He worked under an engineering professor he met during a MESA summer bridge program and became involved in the university's Integrated Media Systems Center, which is a collaboration of the schools of engineering, cinema and communications. Santana went on to make an interactive CD-ROM about radiology that educates small children waiting to be examined. He presented his work nationally to rave reviews.

Fast forward sixteen years and Santana still stays ahead of the technology curve with his work. The 36-year-old is now Senior Product Manager for the Amazon App Store. He is responsible for ensuring that customers have a good experience when using the application store on mobile devices.

"Working in the mobile space has been my career theme for some time now," he said. "It's very rewarding when millions of customers are using your products." Santana said he attributes that early exposure with MESA at USC to his career success. Santana, a first generation college student, graduated in 1998 with a degree in computer engineering and computer science.

"MESA put value in the networking aspect of engineering and those early relationships really helped guide me in the right direction," he said. "The program provided a stepping stone and way to jump-start my education in engineering. That early exposure got me interested in how computers allowed for an immersive experience."

His interest in user experiences landed Santana a job with Disney in its Imagineering Research and Development group directly after college. During his 10 years there, he conceived and built new media and mobile technology that enhanced people's Disneyland park visits. Santana also held a two-year stint at Qualcomm, working on live mobile TV and e-reader products.

Several years ago Santana also worked with MESA and Texas Instruments to develop an experimental math diagnostic software tool for teachers. ◆ with fellow MESA students at their respective campuses and will give presentations to MESA pre-college students.

"This collaboration between San Diego State and the San Diego MESA Alliance allowed for all levels of MESA students to engage in the research process. This early exposure and peer to peer learning is a powerful tool for raising interest in STEM," said Rafael Alvarez, San Diego City College MESA director. **◊**



Community college students get the basics on presenting research findings.

ORACLE / ALICE Continued from page 1

UC Santa Cruz MESA centers. Teachers are now training students, who must work in teams to create an educational game that teaches ways to advance cyber security. Each entry must include a description, instructions, and a PowerPoint presentation on the game.

Oracle employee volunteers will play each game, review the reports, and judge the competition.

The top three teams from each state will advance to the next competition level in which Oracle will embed bugs in the games and the teams must de-bug them within a time limit. The top three teams will win prizes, including trophies.

Maryland MESA students piloted the competition last year. This will be the first year that California and Pennsylvania MESA students will participate.

Teams will submit games in March and winners will be announced in April. ♦

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NEWSBRIEFS

Dr. Oscar Porter, MESA's executive director, was named an advisory board member of the California STEM Learning Network (CSLNet). The organization joins together science, technology, engineering and math (STEM) organizations from across the state to build a common effort to address STEM education issues. Board members represent California STEM leaders from higher education, industry and the nonprofit sector.

➢ MESA HIRES NEW DEVELOPMENT DIRECTOR

Julian Martinez has been appointed MESA's new Director of Resource Development and Marketing. Martinez has served as MESA director at the Colorado School of Mines. a member of Colorado MESA's Board of Directors, and a tutor at the UC Santa Barbara MESA center while a senior engineer at the Naval Surface Warfare Center. He has also worked at the Level the Playing Field Institute (a STEM program), the Hispanic Scholarship Foundation, Diablo Valley College, and as CEO of Rare Air Consulting. He has a bachelor's degree in electrical engineering from the University of Texas at El Paso and a master's degree from the

interdisciplinary telecommunications program at University of Colorado, Boulder. Martinez will use his extensive knowledge of MESA in capital campaigns, grant development and promoting individual giving campaigns.

SHADOW DAY FOR MESA

Cisco employees will mentor MESA undergraduate students as part of a one-year pilot program. The program will begin with a shadow day in March at Cisco in San Jose. Thirty MESA students from the following college campuses will be chosen to attend: Cañada, Gavilan, Hartnell, Mission, San Jose State University and UC Santa Cruz. Students will spend a half day at Cisco, learn more about the company's work and meet their mentors. MESA students and Cisco employees will then meet monthly online for a year to discuss student areas of interest and engage in coaching and mentoring discussions.

➢ MESA SUBJECT OF RESEARCH STUDY

A study funded by the National Science Foundation has resulted in initial findings that MESA activities positively influence underrepresented high school students' perceptions of engineering and interest in engineering as a career choice. The report found the MESA program brings about such positive results as making learning fun, building confidence and feelings of accomplishment and comradery, and exposing students to new opportunities. The study was led by Christine E. Hailey, senior associate dean and professor of mechanical and aerospace engineering at Utah State University. She is also director of the National Center for Engineering and Technology Education and presented the study at the American Society for Engineering Education annual conference and expo.

MESA

Principal Investigator Dr. Henry T. Yang, Chancellor, UC Santa Barbara Chair, Board of Directors Joseph M. Rivera, Southern California Gas Company Executive Director Oscar Porter Communications Director Teri Lee Editor, MESA News Danielle McNamara Design & Layout Seventeenth Street Studios

MESA's website can be reached at mesa.ucop.edu

MESA News is published by the MESA Statewide Office, University of California, Office of the President, 300 Lakeside Drive, 7th Floor, Oakland, California, 94612-3550, (510) 987-9337.

MESA (Mathematics, Engineering, Science Achievement) serves educationally disadvantaged students with an emphasis, to the extent possible by law, on students from groups with low rates of college eligibility, so they can excel in math and-science and attain math-based degrees from four-year institutions. MESA is administered by the University of California.

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