Summer/Fall 2012 Vol. 36, No. 2

# **MESANEWS**

### MATHEMATICS, ENGINEERING, SCIENCE ACHIEVEMENT

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# **CA MESA sweeps nationals**

ALIFORNIA MESA TEAMS engineered huge wins to become champs of the MESA National Engineering Design Competition Wind Energy Challenge.

Both California middle and high school teams finished first in the competition held at the Boeing Assembly Facility in Renton, WA in June. They designed and built windmills.

The winning middle school team is from Isbell Middle School in Santa Paula. The high



See all the winners on page 4.

### First virtual conference for STEM teachers

**FOR THE FIRST** time MESA offered an online conference that allowed almost 200 teachers/advisors to explore innovations in science, technology, engineering and math curriculum through a virtual experience in July. In a special videotaped message, Lt. Gov. Gavin Newsom welcomed teachers to the Virtual MESA Academy for Science and Mathematics Educators (vMASME).

The academy provided fresh ways for teachers to connect math and science theory to hands-on practices. Sponsored by CTB/McGraw Hill, vMASME offered best practices and cutting-edge approaches developed by educators and industry.

The first vMASME conference was broadcast from the University of the Pacific and the University of Southern California. MESA advisors from Pacific and USC attended in person while advisors throughout the rest of the state viewed at local MESA sites.

With the theme, "STEMulating the Future," vMASME's goal was to engage advisors through the tech-savvy event while saving on travel costs for advisors from some of the state's most underperforming schools.

Workshops included an introduction to the NASA Digital Learning Network, Discovery Education digital learning, educational games on gaming consoles, an introduction to Make Movement and MESA, and Oracle's software for 3-D graphics for student use.

See Newsom's video at mesa.ucop.edu. 💠

school team hails from Stagg High School in Stockton.

Both teams spent months planning, designing, and testing their devices and beat hundreds of other teams during local preliminary and regional competitions to become California champs. They went on to compete against the top MESA teams from other states.

Teams were tested for their ability to explain the physics and math involved, presentation of the testing and design process, and the actual performance of their devices.

NATIONALS Continued on page 4

# New online center

**ESA HAS LAUNCHED** an online resource center to serve staff, students, center directors, teachers and parents across the state.

MESA OnlineU is a virtual hub that ultimately will include classes, curriculum, tutorials, professional development, discussion boards and video banks for MESA students and parents. The ultimate goal is to reach all 20,000 MESA students and beyond as MESA OnlineU will also serve those students who are not physically within reach of a MESA center.

OnlineU will expand on a framework developed by the California State University, Fresno MESA center over the last three years. Fresno MESA has successfully produced online courses for its middle and high school MESA teachers/advisors, students and parents. During a pilot period, four other centers have begun to use the Fresno model of OnlineU, customizing modules for their specific needs.

For now, content is focused on providing materials to streamline and standardize MESA resources for pre-college MESA staff. Gradually, more attention will shift to

> VIRTUAL Continued on page 5

# NORTHERN



## Keep pushing forward, Sacto senior advises

**OR MESA STUDENT** Ariana Castillo, helping the next generation of engineers is just as important as maintaining her 3.4 grade point average. Castillo, on track to graduate in 2013 from Sacramento State University in civil engineering, was active in sustaining a math program that helps new students build good math study habits and prepare for the rigors of college. Castillo is also president of the Sacramento State Society of Hispanic Professional Engineers and plans to earn a doctorate in the water resources field. She answered a few questions recently about her involvement with MESA.

### **Q:** What elements of MESA do you most appreciate?

**A:** I truly appreciate the family atmosphere that MESA brings to schools. I am very lucky to be a part of MESA and I hope to give back to my peers and the MESA staff as much as I can.

**Q:** What advice would you give to middle school and high school MESA students?

**A:** I would advise middle school and high school MESA students to keep pushing forward. All of your efforts will pay off when you receive your degree, but the most rewarding feeling of all is helping others achieve success.

### **Q:** What does MESA mean to you?

**A:** To me, MESA is a program that facilitates academic development and individual growth and offers participants the opportunity to help others do the same. ♦

# SFSU grad readies for life as Boeing engineer

"MESA gave me the

confidence to be

ready for anything."

**ITH A JOB** lined up at Boeing, Jasmine Williams says she's ready for the next chapter in her life.

The San Diego native graduated last May from San Francisco State University with a civil engineering degree and a

focus in structural engineering. Before she found MESA, the 24 year-old was leaning toward a business major, but wasn't excited about that field. She didn't know what engineering

was, but during her sophomore year she became involved with MESA and everything changed.

"I'd always liked to take things apart and see how they worked," she said. "So finding out about civil engineering where you produce a finished product was the perfect match."

Williams' mom raised her, her sister and two brothers singlehandedly by working as a transit district dispatcher. Her mom wanted her to go to college but the family couldn't afford the tuition. That didn't stop Williams.



"I've always been self-motivated. I think paying my way through college made me more independent than others," she said. "Being in MESA helped so much, though, because I met others who were going through the same thing as me. I can't think about my col-

> lege experience without thinking about MESA." That mutual support through MESA classmates helped her keep focused academically.

Williams stayed busy

during her time at San Francisco State. She was vice president and president of the National Society of Black Engineers chapter and she earned internships at the San Francisco Public Utilities Commission and Jacobs Engineering.

Williams worked on her upper division classes while studying abroad in Hong Kong, an experience she said changed her life.

"My family doesn't have money for vacations. I'd only been out of California twice, let alone out of the country, so this was amazing."

This summer she volunteered at schools in Oakland to help young students with hands-on math and science projects. Beside encouraging local youth with her volunteer work, Williams—who is the first in her family to go to college—inspired her mother as well. Her mom finished an online degree shortly after Williams' San Francisco State graduation.

Soon Williams will work on structural design for the 747 aircraft as an engineer at Boeing. She's ready for the challenge of the new job.

"MESA gave me the confidence to be ready for anything," she said.  $\diamond$ 

Jasmine Williams credits San Francisco State MESA director Dr. Nilgun Ozer, left, with guiding her through a civil engineering degree.



Aisha Bowe, left, guided MESA students during a NASA Ames site visit.

# NASA engineer finds rewards

**T ONLY TOOK** one end-of-the-year MESA banquet and NASA aerospace engineer Aisha Bowe was hooked.

The 26-year-old, involved with MESA for over two years, is San Jose State University MESA's pre-college NASA liaison. In this capacity, she does everything from mentoring high school interns and holding interview workshops to judging MESA Day competitions and leading NASA site tours.

Bowe said her passion for MESA students and her ability to relate to their backgrounds motivates her to support the program.

"It's not only me giving," she said. "As much as I give, [the students] give back even more."

At NASA, Bowe works on algorithms to make air travel safer, cheaper, and more efficient. She was recently awarded the NASA Honor Award for Equal Employment Opportunity, in part for work with MESA. Bowe credited NASA employees for supporting her work with MESA.

Now, she helps MESA students who are placed at NASA Ames by mentoring them and facilitating their career development.

"I don't think (the students) realize how awesome they are," she said. "They really inspire me."

To see more about NASA's involvement with MESA, go to **mesa.ucop.edu. ◊** 

# MESA shows engineer the way to succeed

be's always been interested in math and science, the guidance

and support he got from MESA was the push he needed to excel.

The San Jose State University alum graduated in 2011 in mechanical engineering. He is a process engineer for Sanmina-SCI where he overlooks the manufacturing of prototype circuit boards.

Education was important in his family, but not a priority—his parents have middle school educations. However, Cardenas persisted in his education.

He met people from similar backgrounds when he became involved with MESA at San Jose State University after transferring from Monterey Peninsula College in 2008. Cardenas had difficulty at first after the transfer and spent hours each



week at the MESA center. Finally, he became more comfortable on the new campus in the new city by connecting

> with other MESA students. The support he received from tutoring and academic counseling helped him attain the challenging degree.

"MESA definitely helped me achieve my educational goal. I couldn't have done it otherwise," he said.

Now Cardenas has high hopes for his younger sister. He encouraged her to go to college and now she's a business major at San Jose State University.

"I'm a role model for her and I'm helping to guide

her through," he said. "It makes me feel proud."

He said his ultimate career goal is to parlay a job that involves his passion for cars and how they work, and become involved in vehicle design.  $\diamond$ 

## Future leaders learn from industry

**ORE THAN 150** future engineers and computer scientists will learn key career skills from industry representatives at MESA's annual conference for selected student leaders. The conference will take place this year on October 19th and 20th in Sacramento.

The Student Leadership Conference offers extensive professional and leadership development through direct interaction with industry mentors and speakers. The engineering and computer science students are from universities and community colleges across the state.

The event is sponsored by Pacific Gas and Electric, Southern California Gas, Vanir Construction, Edison International and Lawrence Livermore National Lab. All of the companies will provide speakers and interviewers. Representatives will work with students to develop the leadership skills sought by industry.

Participating campuses include American River College, Butte College, Cañada College, City College of San Francisco, Contra Costa College, Cosumnes River College, Los Medanos College, Mission College, Napa Valley College, Sacramento City College, San Joaquin Delta College, Santa Rosa Junior College, Skyline College; California State University campuses Chico, Fresno, Long Beach, Los Angeles, Sacramento, San Diego, San Francisco, Sonoma; and University of California campuses Riverside, Santa Cruz and Santa Barbara, and the University of the Pacific. ◊

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# Grad builds mousetraps for MESA, jet fighters for Northrop

RAUL RODRIGUEZ III was interested in rockets and building things as a child, but didn't know how that curiosity related to school or a career.

While at Delano High School near

Bakersfield he built mousetrap cars and balsawood gliders for MESA competitions. His involvement in MESA Days made the connection clear and pushed him to pursue an engineering degree.

Now the 31-year-old Northop Grumman manufacturing engineer helps design and build the F35 Strike Fighter.

Rodriguez's parents didn't finish high school and he had no one in his family to push him toward higher education.

### NATIONALS Continued from page 1

The Isbell team members are sixth graders Tobin Fincher, Nathan Rabago, Carlos Gomez and Carson Gray. They are led by MESA advisors Cari Leidig and Diana Georghiou. Isbell students are served by the MESA center at the University of California, Santa Barbara College of Engineering.

The Stagg team members are 10th grader Brooklyn Omstead, 11th grader Emily Cornelison, and 12th graders Julian De Los Santos and Sean Ferguson. They are lead by advisors Andrew Walter and Kathy Sady. Stagg students are served by the MESA center at University of the Pacific School of Engineering and Computer Science.

The wind energy design competition falls in line with MESA's goal to stay current with science, engineering and technology trends. The project teaches design principles such as torque, generating and storing wind energy as well as how to think like environmental scientists. "That's what MESA did," he said. "They gave me that avenue, a vision of college. Without that I wouldn't be where I am now."

He is the oldest of five and

"MESA gave me<br/>a vision of college.<br/>Without that,pushes for his<br/>younger siblings<br/>to continue to<br/>college. One<br/>sister wants to be<br/>a doctor; another<br/>is a bio engineer-<br/>ing major at

Polytechnic University Pomona. Although his siblings don't have MESA in their schools, Rodriguez takes them to summer programs each year to expose them to math and science.

California State

This was the first year Brooklyn Omstead of the Stagg team was involved with MESA. Her older sister, Ashley, was also in MESA and is now an engineering student at Pacific. "It's just like what MESA did for me," he said. "It's all about exposure and knowing what's out there." ◊



Brooklyn said winning the championship has been a surreal experience.

"It's taken me a while to process it all," Omstead said. "All those long hours were tough, but they definitely paid off." ◊



### Transfer student headed to finish line at UCLA

FTER SOME SLOW starts and a career change, Brian Anderson is now on the path to his dream job. The 28-year-old transferred from Pasadena City College (PCC) to University of California Los Angeles after a previous stab at college, a stint as a firefighter and a twoyear church mission to the Philippines.

Now he is two quarters away from an engineering geology degree. Then he'll begin working full time for the engineering and environmental consulting company that hired him as an intern early last year.

He credits MESA with helping him tackle the transfer process, tutoring and providing overall support, giving special credit to former director Juan Carlos Morales.

"The fact that someone else was holding me accountable and wanted to see me succeed really helped me," he said.

Anderson, a Native American of the Pascua Yaqui tribe, was also accepted to UC San Diego, UC Santa Barbara and UC Davis, but chose UCLA because it was the only school with an engineering geology major. He is one of eight students in the program. Engineering geology combines the science of geology with the concepts of civil engineering.

His internship-turned-job at Trihydro Coportation includes drilling, well management and monitoring ground water for refineries. As a lover of the outdoors, Anderson said this job is a perfect fit.  $\diamondsuit$ 

### VIRTUAL

### Continued from page 1

developing modules of special interest to teachers/advisors, then students, as MESA center staff become more experienced with the software platform.

This year additional MESA pre-college directors will test and give feedback on best practices, strategies and challenges. Later, OnlineU will expand to meet the needs of MESA community college and university programs. ◊

# Valedictorian attributes success to hard work

"People say,

'you're so lucky,'

but it's not luck.

I worked really

**EVENTEEN-YEAR-OLD** MESA student Edgar Garcia has some impressive accomplishments he can boast about.

He's the valedictorian of his graduat-

ing class at Watsonville High School and is a Gates Millennium Scholar. He'll begin studying biomedical engineering this fall at Brown University and has already been accepted into the university's postgraduate medical school through a special program.

Garcia became a superstar at Watsonville High, but none of the success has gone to his head.

"People say 'you're so lucky,' but it's not luck. I worked really hard for this," he said.

Garcia credits MESA with opening his eyes to the career of engineering and the college application process.

"Thanks to MESA Lam where Lam now," he said.

He began with MESA at Lakeview Middle School in Watsonville and did well in MESA Day competitions such as the egg drop project. Once in high school he

moved on to the mousetrap car and balsa wood glider competitions and later began tutoring younger students with their projects.

Garcia said he's always found comfort

in calculations because after moving from Mexico at age 9 without knowing any English, math was his only common denominator.

He's the first in his family to go to college. Garcia's younger brother is now a junior at Watson-

ville High—and also in MESA with plans to go on in higher education.

Garcia's parents have worked for Dole since moving to California and he attributes them with his drive to succeed. During his summer break, Garcia had a job building boxes to transport strawberries. He didn't need the money; as a Gates Scholar his education costs were covered.

"This job prepares and motivates me for college," he said. "I want to remember my roots and know what my family has had to do to support me." 💠



Edgar Garcia, left, at Watsonville High School graduation ceremony, with friend and salutatorian Abraham Corrales

hard for this."



# SOUTHERN

# Petroleum engineer recalls MESA role in career journey

**STUARDO IRIARTE MOVED** to South Central Los Angeles from Guatemala when he was eight years old. He began with MESA in 9th grade at the LA Center for Enriched Studies, and continued while a student at El Camino College in Torrance and California State University, Long Beach. Iriarte earned a bachelor's degree in mechanical engineering in 2008 and a master's degree in dynamics, control systems and vibrations from CSU Long Beach in 2011. He has worked for Honeywell Turbo Technologies, the Valero Wilmington Refinery and Northrop Grumman Corporation, and is currently a production engineer for Occidental Petroleum Corporation in Long Beach.

### **Q:** What was it like to arrive in a new country at such a young age?

**A:** The hardest part was the language barrier. My first year was pretty difficult but I quickly picked up the language. I was eight at the time and started the second half of second grade in the US. I recall being teased about not speaking the language. The first time I spoke out loud in class was in the fourth grade.

### **Q:** What challenges did you face growing up in South Central LA?

**A:** Aside from the crime and violence in my community, the hardest challenge was staying away from bad influences. One of the contributions MESA provided me with was doing just that, it kept me busy enough to keep me away from the bad influences.

### **Q:** What do you remember most about MESA in high school?

**A:** My mom, as a single mother, worked a lot to keep our family afloat. She did not have the time or knowledge to expose me to the world of engineering. MESA planted this engineering seed through many of its activities. Many of the college visits, MESA days and activities that I participated in gave me a good idea about the world of engineering.

## **Q:** How did MESA help you at El Camino College?

**A:** At El Camino College I once again found a helping hand, this time in the

form of mentorship and coaching from (MESA director) Arturo Hernandez, and workshops, internships and MESA study groups. MESA showed me what I needed to do, referred me to the appropriate people to set up my educational plan. Once my roadmap was set, MESA provided free workshops on the core classes I needed help with, provided me with great resources in the form of a computer lab and a place to study with fellow engineering students, contacts in the engineering community, scholarship opportunities and even helped me land my first internship.

### **Q:** Were you the first in your family to go to college? If so, how does that feel?

A: My mother attended college in Guatemala, but it has no equivalency in the US. In the States, my mom supported us by being a janitor and cleaning houses. It felt great to be the first in our family to graduate from college in the United States.  $\diamond$ 





John Santos leads robotics teams for MESA students.

# Advisor wins nat'l educator award

**ESA ADVISOR JOHN SANTOS** was named one of the country's outstanding educators by the Carlston Family Foundation.

Santos is one of five winners named this year and will be recognized at the Foundation's annual ceremony and education symposium in November.

Since 2002 the Carlston Family Foundation has identified stellar public school teachers based on nominations by former students who have advanced to college. Each teacher receives \$15,000 and an additional \$5,000 for the educator's school. Santos, has taught at Manual Arts High School in Los Angeles (part of the USC MESA center) for 19 years and has been a MESA advisor for 8 years. He recently led a team of MESA students to an 8th place finish in an international robotics competition.

Santos raises money for college scholarships from local industry for all graduating MESA seniors. "John Santos goes way beyond the epitome of what a teacher should be; he is caring and student centered, resourceful and dedicated, and with a strong network of support," said USC MESA center director Larry Lim.

Santos said he enjoys his work and that winning the award means he'll just have to step up his work even more.

"I'm lucky to work with a great group of kids and teachers who never settle for less," he said. "MESA works and you can see that by all the phenomenal things our students achieve." ◊

# MESA star continues success in college

**B RYAN ELENES STARTED** his academic career on a high note with MESA and has been successful ever since. In 2006 he and three teammates from

Roosevelt Middle School in Compton represented California in the MESA National Engineering Design Competition. At the event, Elenes' team bested all other MESA middle school teams, winning first place.

The competition trip marked the first time Elenes had stayed in a hotel or traveled that far from home. After the win, accolades came in from state and federal legislators, as well as the mayor.

Six years later, the 20-year old is still involved with MESA as a civil engineering major at University of California Irvine, his MESA center as a middle and high school student. He enjoys giving back by helping to organize the MESA Day events he thrived in while attending grade school.

Elenes said he was a poor math student in 7th grade and only joined MESA because he heard about the projects. "But when I heard there was going to be math, I thought, 'oh man, I don't know,'" he joked.

"At first I didn't understand how the MESA projects and math were related, but MESA projects helped me understand math a lot better."

As the first in his family to go to college, Elenes said his parents didn't understand the benefit of MESA until they attended a session that explained the income difference of high school graduates versus college graduates. From then on, his parents were total supporters.

In his community, Elenes said many kids want to be policemen, firefighters or construction workers and aren't aware of other career options. Elenes hopes to work for the California Department of Transportation after graduation. His dream job is to design freeways and bridges—a career he said he didn't know existed before MESA.

# **Balancing work and family**

ABRIELA CEPEDA-RIZO PURSUED her interest in math and science as a MESA student. Now she is continuing her career while raising a next generation of technical professionals.

The civil engineer at Chevron has an 11-year-old daughter who wants to be a chemist and 9- and 5-year-olds who are equally interested in math and science.

Cepeda-Rizo, a 1995 graduate of Cal Poly San Luis Obispo and MESA student at Bell High School, met her husband Juan at the Cal Poly MESA center while an undergrad. She said MESA had an impact on her becoming an engineer—and on marrying one.

Cepeda-Rizo was the middle child of five siblings whose mom worked three jobs to support the family. Her parents never went beyond an elementary school education. Although her parents approved of their older girl going to college locally, they were unhappy about her leaving the LA area for school at Cal Poly. "Every week I'd call home and my mom would say, 'I don't want you there,'" Cepeda-Rizo said. "It was the week before graduation and she was still saying the same thing."

Cepeda-Rizo earned an internship with Chevron the summer before her freshman year and has been there ever since. She is a project manager for refinery initiatives and works part-time to be with her children.

"After seeing my parents work so hard it is a blessing to have this kind of flexibility that this engineering career can bring," she said. "For me, MESA brought that additional support to help me get through school to make it this far." **>** 



Elenes as a middle school student (left) and as an undergrad (above)

# Advisors reach for the stars

**WO MESA ADVISORS** were selected to join an exclusive club: to fly aboard the largest airborne observatory in the world.

MESA advisors Ira Harden and Vicente Washington are two of 26 educators nationwide selected for research flights aboard NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA).

Harden and Washington teach science and math at City Honors College Preparatory Charter School, served by the University of California Los Angeles MESA center.

The goal of SOFIA is for educators to bring astronomy back to their communities. The teachers will fly above the stratosphere on a 747 equipped with an infrared telescope to view celestial bodies. Flying at this altitude allows them to take energy readings without the distortion caused by the earth's

atmosphere when using a telescope.

The program will begin in the fall. Washington, who has been a MESA advisor for 11 years, said he and Harden plan to use the findings for an astronomy exposition for the community.

"The students are really excited for this," he said. "It has gotten them really interested in the subject and we're even hoping to start an astronomy class." ◊ ADDRESS SERVICE REQUESTED

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### NEWSBRIEFS

#### ➢ MESA JOINS CA STEM TASK FORCE

MESA Executive Director Oscar Porter was appointed by State Superintendent of Public Instruction Tom Torlakson to his statewide science, technology, engineering and math (STEM) task force. The team will explore the status of STEM education in the state and recommend how to improve teaching, learning and equal access to STEM courses and careers for California's K-12 students. The task force, made up of education, nonprofit and elected representatives, will focus on the following areas: curriculum and instruction, resources, professional learning, student testing and assessment and community and business partnerships. For details, go to http://mesa.ucop.edu/ news/pressreleases/

#### MESA BEST PRACTICES NAMED AMONG NATION'S BEST BY NASA

MESA's Imperial Valley director was one of only four educators from across the country invited to present at a NASA forum this past June. At NASA's invitation, MESA Director Jeanette Espino traveled to Washington, D.C. to share best practices from her center's Summer of Innovation (SoI), a NASA summer program for middle school students.

Espino's Imperial Valley program was selected for this honor from over 200 Sol programs. "They told us we were the best of the best," said Espino.

Forum attendees included Sol project leaders and the NASA Office of Education leadership team.

The NASA Sol goal is to improve skills and enhance engagement of middle school students in STEM. Imperial Valley MESA completed its second SoI program this summer, in which over 2,000 MESA middle school students from seven school districts used space exploration as a focus for hands-on projects, career exploration, and field trips.

### ➢ NASA/MESA CONTINUE RELATIONSHIP

NASA continued to support MESA efforts with two grants in southern California. The space agency's Aerospace, Education, Research and Operations (AERO) program awarded \$25,000 and \$17,500 to the Imperial Valley and San Diego State MESA centers respectively to implement NASA Summer of Innovation (SoI) activities. (See the NASA story, above.) The money provided for special summer and after school programs for MESA middle school students. NASA also has funded a portable planetarium to MESA's Resources for Indian Student Education center and numerous MESA students have earned NASA internships.

#### $\,\,pprox\,\,$ A NEW WAY TO CONNECT WITH MESA

Connecting with MESA is easier now with our new "Get Involved" web page. You'll find resources for companies, individuals, foundations and alumni so they can interact with MESA in a number of exciting ways. Just go to **mesa.ucop.edu/ getinvolved** to get started.

#### ➢ INDUSTRY CONTINUES MESA SUPPORT

MESA's proven record of success in preparing California's youth for careers in STEM has spurred industry contributions. Continued support from long time partners such as Pacific Gas and Electric and Lawrence Livermore Lab as well as a newer partnership with Edison International have resulted in full funding of the MESA Student Leadership Conference (see page 3).

### ➢ FRESNO GRANT

Fresno area MESA students received an extra boost of support through a grant from the Fresno Regional Foundation. The \$23,200 grant went to fund MESA Saturday Academies, which are full day workshops of hands-on math, science and engineering activities. California State University Fresno MESA serves more than 1,200 students at 23 middle and high schools. ♦

# **MESA**

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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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