SIEMENS | Foundation

NEWS RELEASE

Contact:

Elizabeth Cho
Siemens Foundation
917-622-2413
elizabeth.cho@siemens.com

Michael Zerman
Weber Shandwick
314-552-6787
mzerman@webershandwick.com

STUDENTS FROM CALIFORNIA NAMED REGION ONE
SIEMENS COMPETITION WINNERS

Winners From Regional Competition Move on to National Finals in Washington, D.C.

Andrew Chen (Fremont, Calif.) Wins Top Individual Honors;
David Zhu (Saratoga, Calif.) and Evani Radiya-Dixit (San Jose, Calif.)
Win Top Team Honors

ISELIN, NJ, Nov. 23, 2015 – Months of research and preparation in science, technology, engineering and mathematics (STEM) fields paid off for three students named National Finalists in the Siemens Competition in Math, Science & Technology after earning top spots in Region One. **Andrew Chen** of Fremont, Calif. earned top individual honors and a $3,000 scholarship for his research on finding a new way to carry out *in vivo* microscopy to improve imaging of fine structures in biological samples. Research on a machine learning algorithm that can robustly discriminate between benign and malignant breast cancer cells earned **David Zhu** of Saratoga, Calif. and **Evani Radiya-Dixit** of San Jose, Calif. the $6,000 shared team scholarship and spots in the finals of the nation's premier research competition for high school students.

The students presented their research this weekend to a panel of judges at the California Institute of Technology, host of the Region One Finals. The top winners now move to the final round to present their work at the National Finals in Washington, D.C., December 4-8, 2015, where $500,000 in scholarships will be awarded, including two top prizes of $100,000. The Siemens Competition, a signature program of the Siemens Foundation, is administered by Discovery Education.

"The students are what make the Siemens Competition a truly special event," said David Etzwiler, CEO of the Siemens Foundation. "Each student shows a passion and determination for tackling some of today's most complex challenges. The applications of their research are incredibly inspiring and have the potential for real-world impact."

The Winning Individual for Region One

Andrew Chen, a senior from Mission San Jose High School in Fremont, Calif., won the individual category and a $3,000 scholarship for his project entitled, "Enhancing Imaging Resolution and Depth With Adaptive Optics Focal Modulation Two-Photon Microscopy."

When faced with the prospect of losing his own vision, Andrew decided to search for ways to improve imaging and the visualization of fine structures within biological samples. Andrew was able to develop a new way to carry out *in vivo* microscopy to better see the fine structures in deep tissue, and hopes that

this research will help doctors and biologists better diagnose and treat deadly diseases like Alzheimer's and cancer.

"The microscope is one of the most important tools in the world of biology. This is a hot field right now, with a Nobel Prize recently awarded for research on super-resolved microscopy," said competition judge Dr. Haowen Ruan, Postdoctoral Scholar in Electrical Engineering at the California Institute of Technology. "Combining the advanced optical techniques, Andrew successfully demonstrates that the imaging resolution, signal-to-noise ratio and speed were significantly improved with the imaging method he used. This could eventually be applied to biological labs and clinics to be able to see deeper and clearer."

As the president of his school's Physics Club, Andrew has helped pave the way to encourage physics education to the whole school by developing his own lectures and problem sets. With his love for physics, he hopes to combine science and entrepreneurship to develop technologies that can positively impact the world. Outside the classroom, Andrew leads the Emerald Ensemble, a volunteer band, and plays the trumpet and piano and enjoys cross country, swimming and skiing.

Andrew's mentor is Dr. Xiaodong Tao, University of California, Santa Cruz, W. M. Keck Center for Adaptive Optical Microscopy.

The Winning Team for Region One

David Zhu and **Evani Radiya-Dixit**, both juniors from The Harker School in San Jose, Calif., won the team category and will share a $6,000 scholarship for their project entitled, "Automated Classification of Benign and Malignant Proliferative Breast Cancer Lesions."

The team of David and Evani developed predictive algorithms that automate the categorization of breast lesions as either benign usual ductal hyperplasia (UDH) or malignant ductal carcinoma in situ (DCIS).Their model can help improve breast cancer diagnosis accuracy, thereby reducing under-and over-treatment.

"David and Evani adopted a technique that is at the forefront of technology and the winners had a complete understanding of their work," said competition judge Dr. Alexandre Cunha, Director, Center for Advanced Methods in Biological Image Analysis at the California Institute of Technology. "In this 'big data' era, with a larger data set, David and Evani's approach has the potential of being very applicable to help distinguish a breast cancer tumor as benign or malignant. This could lead radiologists to be able to better diagnose biopsy images."

David Zhu served as the project lead. After David lost a close family friend to breast cancer, he was motivated to develop a system that can detect cancer at an earlier stage. David's favorite subject in school is computer science where he enjoys writing code capable of solving real-world problems, and aspires to be a computer engineer. David also coaches the Middle School Science Bowl Team, and encourages his school to have more hands-on science experiment demonstrations as opposed to traditional classroom exercises. Outside of school, David plays tennis and basketball, and he also plays piano and other percussion instruments.

Evani's interest in technology and computer science was inspired by breakthroughs like Google's low-orbiting satellites intended to beam Internet to the world's remote areas. She believes that STEM education can create unimaginable innovations and can accomplish what people thought was unsolvable only a few decades ago. Outside of school, Evani participates in Future Problem Solving and volunteers at Sacred Heart, a community service organization. She enjoys running and playing tennis as

well as writing and singing.

The team's mentors are Dr. Andrew Beck, Professor of Pathology at Beth Israel Deaconess Medical Center, Dana Farber Cancer Center and Mr. Chris Spenner, Physics teacher at The Harker School.

Regional Finalists

The remaining regional finalists each received a $1,000 scholarship.

Regional Finalists in the individual category were:
- Michael Ai, Canyon Crest Academy, San Diego, Calif.
- Anjini Karthik, St. Francis High School, Mountain View, Calif.
- Clarence Nakano, Flintridge Preparatory School, La Canada, Calif.
- Ethan Shen, Cupertino High School, Cupertino, Calif.

Team Regional Finalists were:
- Kenz Kallal, Weston High School, Weston, Mass., Felix Wang, Roxbury Latin School, West Roxbury, Mass. and Matthew Lipman, Boston University Academy, Boston, Mass.
- Evan Lavery, Oregon Episcopal School, Portland, Ore. and Grant Kresge, Wilsonville High School, Wilsonville, Ore.
- Edward Park, Larchmont Charter School, Los Angeles, Calif., Emory Kim, Harvard –Westlake School, Studio City, Calif. and Gina Choi, Harvard –Westlake School, Studio City, Calif.
- Tara Thakurta, Castilleja School, Palo Alto, Calif. and Kathryn Li, Palo Alto High School, Palo Alto, Calif.

The Siemens Competition
Launched in 1998, the Siemens Competition is the nation's premier science research competition for high school students. Nearly 4,000 students registered for this year's competition and a total of 1,781 projects were submitted for consideration. 466 students were named Semifinalists and 97 were named Regional Finalists. The students present their research in a closed, online forum, and entries are judged at the regional level by esteemed scientists at six leading research universities which host the regional competitions: Georgia Institute of Technology, Massachusetts Institute of Technology, California Institute of Technology, Carnegie Mellon University, University of Notre Dame and The University of Texas at Austin.

For news and announcements about the Regional Competitions and the National Finals, follow us on Twitter @SFoundation (#SiemensComp) and like us on Facebook at Siemens Foundation. A live webcast of the National Finalist Awards Presentation will also be available online at 11 a.m. EST on December 8 at www.siemens-foundation.org.

Interviews, video and photos available by visiting
http://siemensusa.synapticdigital.com/US/Siemens-Foundation.

The Siemens Foundation
The **Siemens Foundation** has invested more than $90 million in the United States to advance workforce development and education initiatives in science, technology, engineering and math. The Foundation's mission is inspired by the culture of innovation, research and continuous learning that is the hallmark of Siemens' companies. Together, the programs at the Siemens Foundation are helping close the opportunity gap for young people in the U.S. when it comes to STEM careers, and igniting and sustaining

today's STEM workforce and tomorrow's scientists and engineers. Follow the Siemens Foundation on [Facebook](#) and [Twitter](#).

Discovery Education
Discovery Education is the global leader in standards-based digital content for K-12, transforming teaching and learning with award-winning digital textbooks, multimedia content, professional development, and the largest professional learning community of its kind. Serving 3 million educators and over 30 million students, Discovery Education's services are in half of U.S. classrooms, over 40 percent of all primary schools in the UK, and more than 50 countries. Discovery Education partners with districts, states and like-minded organizations to captivate students, empower teachers, and transform classrooms with customized solutions that increase academic achievement. Discovery Education is powered by Discovery Communications (NASDAQ: DISCA, DISCB, DISCK), the number one nonfiction media company in the world. Explore the future of education at www.discoveryeducation.com.

# # #