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NEWS RELEASE

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CALIFORNIA, ILLINOIS, NEW YORK AND WISCONSIN STUDENTS WIN REGIONAL SIEMENS COMPETITION AT UNIVERSITY OF NOTRE DAME

Regional Winners Move on to Final Phase of Competition: National Finals in Washington, D.C.

Pranav Sivakumar (Tower Lakes, IL) Wins Top Individual Honors; Katherine Cao (Mequon, WI); William Hu (Saratoga, CA); and Alice Wu (Dix Hills, NY) Win Top Team Honors

ISELIN, NJ, Nov. 14, 2016 –Four students have been named National Finalists in the Siemens Competition in Math, Science & Technology after earning top spots in one of two regional competitions that took place this past weekend. The Competition is the nation's premier science research competition for high school students and promotes excellence by encouraging students to undertake individual or team research projects. For more information, go to: www.siemens-foundation.org.

Pranav Sivakumar of Tower Lakes, IL, earned top individual honors and a $3,000 scholarship for his research studying Almost Dark Galaxies (ADGs), masses that are mainly composed of dark matter, in hopes of learning more about this substance and the history of the universe. **Katherine Cao** of Mequon, WI; **William Hu** of Saratoga, CA; and **Alice Wu** of Dix Hills, NY, shared the $6,000 team scholarship for developing a novel technique for growing dental pulp stem cells, which could potentially improve bone and teeth regeneration. They are among 96 students overall selected to compete in regional competitions across the country this month out of a pool of more than 1,600 projects submitted for the competition this year.

These top regional winners now move to the final phase of the Siemens Competition to present their work at the National Finals in Washington, D.C., December 5-6, 2016, where $500,000 in scholarships will be awarded, including two top prizes of $100,000.

The students presented their research this weekend to a panel of judges at the University of Notre Dame, host of the Region Three Finals.

"These competitors never cease to amaze me with the depth and breadth of knowledge they have acquired on these topics," said David Etzwiler, CEO of the Siemens Foundation. "They are the future of scientific research and they make it clear the possibilities are endless."

The Siemens Competition, launched in 1999 by the Siemens Foundation, increases access to higher education for students who are gifted in STEM and is based on the culture of innovation, research and educational support that is the hallmark of Siemens. This competition, administered by Discovery Education, recognizes and builds a strong pipeline for the nation's most promising scientists, engineers and mathematicians.

The Winning Individual for Region Three

Pranav Sivakumar, a senior from the Illinois Mathematics and Science Academy in Aurora, IL, won the individual category and a $3,000 scholarship for his project entitled, "Searches for Almost Dark Galaxies in Blank Sky Fields with the Sloan Digital Sky Survey."

Pranav developed new ways to scan the Sloan Digital Sky Survey (SDSS), a dedicated 2.5-meter telescope which uses sensitive electronic light detectors to map a quarter of the sky, to identify a number of promising new candidates of Almost Dark Galaxies (ADGs).

ADGs are a class of dwarf galaxies which are dominated by dark matter and give off little to no starlight, making them very hard to detect. They are considered ideal laboratories to study the mystery of dark matter, which makes up about a quarter of our universe. Currently, all of the theory models for how our Galaxy formed predict that there should be hundreds of orbiting dwarf galaxies around the Milky Way, however only a small fraction of these have been found.

"Pranav's discovery is a possible breakthrough in deepening our understanding of the universe, what it's made of, and how our galaxy and stars got assembled together," said competition judge, Dr. Grant Mathews, Professor of Theoretical Astrophysics and Director for the Center of Astrophysics at the University of Notre Dame. "Pranav has exerted a great deal of tedious independent work and found a way to identify a number of promising candidates for these 'missing galaxies,' which could help solve the mystery."

Pranav has been studying ADGs in hopes of learning more about them and the history of the universe. His passion for science started at a young age when at six years old, he started watching video lectures of MIT professor and astrophysicist Walter Lewin. In 2015, Pranav won Google Science Fair's Virgin Galactic Pioneer Award and was later recognized by President Obama at the White House Astronomy Night for his research. Additionally, Illinois Governor Pat Quinn declared June 7th, 2014 "Pranav Sivakumar Day" in recognition of his performance in the National Spelling Bee over a three-year period. Pranav hopes to one day pursue a career as an astrophysicist and continue deciphering the mysteries of the universe.

Pranav's mentor is Dr. Donald York, Horace B. Horton Professor Emeritus, Department of Astronomy and Astrophysics at the University of Chicago.

The Winning Team for Region Three
Katherine Cao of Mequon, WI, William Hu of Saratoga, CA, and Alice Wu of Dix Hills, NY, won the team category and will share a $6,000 scholarship for their project entitled, "Characterizing Novel, Spun-Cast PLA/Polystyrene Substrates of Differential Nanoscale Surface Topographies and Optimizing Cell-Plating Density to Promote Dental Pulp Stem Cell Proliferation and Differentiation in vitro."

Katherine, William and Alice's research looked at new ways of controlling stem cells using biomaterials. They developed a new technique that alters the surface topography on which dental pulp stems cells can be cultured, making it easier for the cells to grow into bone and regenerate teeth.

Dental pulp stem cells are stem cells present in the soft living tissue within teeth. In Katherine, William and Alice's project, they were able to direct dental pulp stem cells using materials that mimic the native tissue and grow back the bone. Their research could have important implications for bone and dental regeneration in patients with severe tooth decay.

According to the US Centers for Disease Control, 17.5% of children aged 5-19 and 27% of adults aged 20–64 have untreated tooth decay.

"Katherine, William and Alice tackled a highly interdisciplinary problem that required a mastery of complex techniques in a variety of areas," said competition judge, Dr. Joel Boerckel, Assistant Professor, Department of Aerospace and Mechanical Engineering at the University of Notre Dame. "The team's research presents a promising step forward, and has potential impact on diseases like periodontitis, a serious gum infection, where the degradation of dental bone tissue makes it extremely challenging to repair or replace a tooth until the bone grows back."

Katherine, a senior at Homestead High School in Mequon, WI, was inspired to pursue this area of research because her parents, both immigrants, have rapidly decaying teeth due to poor childhood care and limited options for treatment. When Katherine first met William and Alice through the Garcia Summer Program at Stony Brook University they connected through a mutual desire to use materials science to help improve the field of medicine. Katherine's favorite subject in school is chemistry, and she credits it for helping her build an understanding of the natural world around her. Katherine is president of Homestead High School's student government and a member of the National Honors Society. She is also varsity captain of the debate team and president of her school's service club. Katherine hopes to one day start a career as an entrepreneur in the life sciences.

William, a senior at Saratoga High School in Saratoga, CA, became interested in STEM at an early age and his interest expanded when he began competing in local and national science competitions. Having suffered from slight dental decay and a tooth extraction himself, William was eager to work with his teammates on developing solutions. William wants to pursue a

career in engineering and believes that the rising field of regenerative medicine holds amazing potential. William has received the Bausch + Lomb Honorary Science Award and the USA Computing Olympiad Gold Division. In his spare time, William volunteers for his local food bank and plays on his school's varsity volleyball team.

Alice, a senior at Half Hollow Hills High School West in Dix Hills, NY, is hopeful that bone cell and teeth regeneration will one day become available to patients in her lifetime. Alice is a student ambassador of Millennial Ambition, an initiative launched by the Women's Fund of Long Island to develop the next generation of young women leaders and promote youth philanthropy. She is also a four-year varsity athlete and captain of the cross country, winter track, and badminton teams at her school. She is planning to study computer science in college.

The team's mentors are Dr. Miriam Rafailovich, Distinguished Professor of Materials Science & Engineering, and Dr. Adriana Pinkas-Sarafova, Garcia Summer Program Coordinator in the Department of Materials Science and Chemical Engineering, both of Stony Brook University.

Regional Finalists

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

Regional Finalists in the individual category were:

- Dhweeja Dasarathy, Hawken School, Gates Mills, OH
- Abhinav Ramkumar, Carmel High School, Carmel IN
- Zoe Solt, Hathaway Brown, Shaker Heights, OH
- Sushil Upadhyayula, Illinois Mathematics and Science Academy, Aurora, IL

Team Regional Finalists were:

- Ketan Agrawal, Columbus Academy, Gahanna, OH, and Hari Kothapalli, Roxbury Latin School, West Roxbury, MA
- Shivani Konduru, Troy High School, Troy, MI; Tiffany Guo, Troy High School, Troy, MI; and Sara Huang, Troy High School, Troy, MI
- Emily Sun, Park Tudor School, Indianapolis, IN; Jessica Mo, Carmel High School, Carmel, IN; and John Wang, Carmel High School, Carmel, IN
- Brandon Wang, University School, Hunting Valley, OH, and Jennifer Wang, Solon High School, Solon, OH

The Siemens Competition

For the 2016 Siemens Competition, 2,146 students (1271 individuals, 304 2-person teams and 89 3-person teams) submitted applications from 46 states plus the District of Columbia and 7 countries with more than 1,600 projects submitted for consideration. 498 students were named Semifinalists from which 96 were named Regional Finalists. For the regional finals, the students present their research in a closed, online forum, and entries are judged by esteemed scientific experts at six leading research universities which host the regional competitions:

Georgia Institute of Technology and Massachusetts Institute of Technology (November 4-5), California Institute of Technology and University of Notre Dame (November 11-12), and Carnegie Mellon University and The University of Texas at Austin (November 18-19).

The winners of each regional weekend will be announced at 12 noon (ET) on the following Monday at ***http://siemensusa.synapticdigital.com/US/Siemens-Foundation.*** 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.

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

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About 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 closing 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. For further information, visit www.siemens-foundation.org or follow @sfoundation.

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