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OHIO AND NEW MEXICO STUDENTS CAPTURE $100,000 SCHOLARSHIP PRIZE IN 2014 SIEMENS COMPETITION IN MATH, SCIENCE & TECHNOLOGY

Peter Tian of Hilliard, Ohio, Wins $100,000 Individual Prize for Research on Multidimensional Matrices;
Eli Echt-Wilson and Albert Zuo of Albuquerque, N.M. Win $100,000 Team Prize for Research on Computational Models for Tree Growth

WASHINGTON, DC, December 9, 2014 — Three students from Hilliard, Ohio and Albuquerque, N.M. were awarded top prizes at the 15th annual Siemens Competition in Math, Science & Technology, the nation's premier research competition for high school students. The students join a highly selective group of just 14 individual competitors and 14 teams previously named winners of the Siemens Competition.

Peter Tian, a senior at The Wellington School in Columbus, Ohio, won the $100,000 Grand Prize in the individual category for mathematical research on pattern avoidance for multidimensional matrices. Eli Echt-Wilson and Albert Zuo, seniors at La Cueva High School, Albuquerque, New Mexico, will share the $100,000 Grand Prize in the team category for research on computational models for tree growth.

[View video, photos, and bios of Siemens Competition winners](#)

The Siemens Competition is a signature program of the Siemens Foundation, a leading supporter of science, technology, engineering and mathematics (STEM) education in the United States. The Competition is administered by Discovery Education. The 15th annual awards were presented this morning at The George Washington University, host of the 2014 Siemens Competition National Finals.

 "Our heartfelt congratulations to Peter, Eli, and Albert for winning this year's Siemens Competition," said David Etzwiler, CEO of the Siemens Foundation. "The inspiring projects submitted by these students demonstrate their commitment to advancing research and addressing some of the world's most challenging issues. Their passion for improving the world through STEM is commendable, and we at the Siemens Foundation, are proud to be a part of their journey."

Six individuals and six teams representing our nation's brightest high school students presented their original research projects at the National Finals this weekend after winning one of six regional competitions in November. They presented their research to a panel of judges comprised of nationally renowned scientists and mathematicians headed by lead judge Robert H. Miller, Ph.D, Senior Associate Dean for Research, School of Medicine and Health Sciences, The George Washington University.

The Winning Individual
Peter Tian won a $100,000 college scholarship for his project, *Extremal Functions of Forbidden Multidimensional Matrices.*

Peter's project makes significant advancements in the theory of pattern avoidance for higher dimensional matrices, and may assist in computing the shortest rectilinear path among obstacles in space. This in turn has potential applications to motion planning in space or circuit design, including implications for other 3D areas dealing with space obstacles, such as drone programming for obstacle avoidance and self-driving cars. His work also extends a number of known results and advances areas of pure mathematics. Within mathematics, his project has a direct application to hypergraphs and it also has potential applications to other areas of combinatorics and computational geometry.

 "Peter's research significantly advances the knowledge of this topic and opens a new area for exploration," said James Haglund, Professor of Mathematics, University of Pennsylvania. "One of the more striking results is the way Peter was able to build on previous work by generalizing standard results and adding multi-dimensions. His work forms a wonderful basis for future graduate research, and he hasn't even studied at the undergraduate level yet!"

From tessellations to the Fibonacci Numbers, Peter has demonstrated commitment to advancing knowledge about patterns and pure math concepts by co-founding his school's math club. Apart from his research, Peter runs for the cross-country team, plays alto saxophone, and volunteers at the Center of Science and Industry. Recent accolades include making it into Cum Laude Society and the Harvard Prize Book. Additionally, he is a Research Science Institute scholar and Mathematical Olympiad Summer Program attendee. Peter intends to become a professor of mathematics, his favorite subject.

"I am most passionate about mathematics and its applications to science and engineering," said Peter Tian. "It is inspiring to see that something as intricate as math can both explain and be applied to our natural world."

The Winning Team
Eli Echt-Wilson and Albert Zuo will share a $100,000 college scholarship for their project, *A Detailed Computational Model of Tree Growth.*

Eli and Albert created a computer model that simulates how a tree will grow in varying conditions, which can replace long-term planting experiments. It can be used to optimize tree plantations, a common way of reducing our carbon footprint. Maximizing the efficiency of tree plantations will be one step among many to aid CO_2 sequestration and mitigate climate change. Other benefits of this research include harvesting timber and growing tree-based food, such as apples. This project adds to the most advanced tree modeling that currently exists through biological rule-based modeling, which is based on first principles.

"Eli and Albert were able to develop graphics that were so advanced, they enabled biological modeling for real trees and situations," said Randy Wayne, Associate Professor, Agriculture and Life Sciences, Cornell University. "Their paper changes the way I looked at trees. Eli and Albert are not production scientists, but rather original, innovative, skilled craftsmen who can work together to help solve a pressing challenge."

Eli serves as spokesman for the New Mexico Supercomputing Challenge. He is also an AP computer science mentor and volunteer website designer. He has been awarded the Botanical Society of America's "Best Student Physiological Paper" and has completed ten AP classes. For his role model, Eli admires Rafael Nadal for his hard work, dedication and ethics in both victory and defeat. In his spare time, Eli plays the ukulele and guitar, performs magic, and plays both tennis and soccer.

"I strive to find applications of machine learning for not only scientific problems but also everyday challenges that affect the entire world," said Eli Echt-Wilson.

Albert has developed a passion for mathematics, and uses his passion to help coach Mathcounts for middle school children in Albuquerque, New Mexico. He keeps an open mind, explaining that inspiration can come from anywhere, at anytime, from anyone. When he is not conducting award-winning research, Albert is playing tennis or chess. He is fluent in two languages. He has previously been awarded the Botanical Society of America's "Best Physiological Research Presentation."

"I like making the world a more interesting place. Stuff that we used to see only in science fiction can now become a reality," said Albert Zuo.

National Finalists
Six individuals and six teams competed at the Siemens Competition National Finals. The remaining National Finalists were awarded the following scholarships:

Individuals
- $50,000 scholarship – Joseph Zurier, Classical High School, Providence, R.I. (Mathematics)
- $40,000 scholarship – Molly Zhang, Richard Montgomery High School, Rockville, Md. (Biochemistry)
- $30,000 scholarship – Ruchi Pandya, Lynbrook High School, San Jose, Calif. (Biotechnology/Chemistry)
- $20,000 scholarship – Jay Zussman, Great Neck South High School, Great Neck, N.Y. (Biochemistry)
- $10,000 scholarship – Anvita Gupta, BASIS Scottsdale, Scottsdale, Ariz. (Biochemistry)

Teams
- $50,000 scholarship – David Wu and Xinchu Tian, Troy High School, Troy, Mich. (Biology)
- $40,000 scholarship – Jonathan Chan, Bergen County Academies, Hackensack, N.J.; Michael Seaman, Homeschool, Short Hills, N.J. (Mathematics)
- $30,000 scholarship – William Crugnola, Jericho Senior High School, Jericho, N.Y.; Katie Mazalkova, Valley Stream Central High School, Valley Stream, N.Y. (Biology)
- $20,000 scholarship – Shakthi Shrima, Homeschool, Austin, Texas; Adam Forsyth, Georgetown Day School, Washington, DC; Jacob Gurev, Mira Loma High School, Sacramento, Calif. (Mathematics)

- $10,000 scholarship – Jason Lee and Allen Lee, Millburn High School, Millburn, N.J.; David Lu, Mills E. Godwin High School, Henrico, N.J. (Biochemistry)

The Siemens Competition
This year marks the 15th Anniversary of the Siemens Competition, the nation's premier research competition for high school students. A record 2,263 students submitted a total of 1,784 projects for consideration – 408 students were named semifinalists and 97 were named regional finalists, representing 38 states. Entries are judged at the regional level by esteemed scientists at six leading research universities which host the regional competitions: California Institute of Technology, Carnegie Mellon University, Georgia Institute of Technology, Massachusetts Institute of Technology, University of Notre Dame and The University of Texas at Austin. The twenty national finalists compete at The George Washington University for $500,000 in scholarships.

For news and announcements about the Siemens Competition, follow us on Twitter @SFoundation (#SiemensComp) and like us on Facebook at SiemensFoundation.

About the Siemens Foundation
The Siemens Foundation supports educational initiatives in science, technology, engineering and mathematics (STEM) in the United States. Its signature programs include the Siemens Competition in Math, Science & Technology and Siemens Science Day. The Foundation's mission is based on the culture of innovation, research and educational support that is the hallmark of Siemens' U.S. companies. For further information, visit www.siemens-foundation.org.

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