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SIEMENS COMPETITION IN MATH, SCIENCE AND TECHNOLOGY**

**Andrew Komo (Bethesda, MD) Wins \$100,000 Top Individual Prize;
Jillian Parker, Jiachen Lee (Dix Hills, NY) and Arooba Ahmed (Melville, NY) Win \$100,000 Team
Prize**

WASHINGTON, DC, December 5, 2017 – Four high school students, one from Bethesda, MD, and a team from Dix Hills and Melville, NY, were awarded grand prizes of \$100,000 scholarships for their significant accomplishments in scientific research in the 2017 Siemens Competition in Math, Science & Technology. The Competition is the nation's premier science research competition for high school students and seeks to promote excellence by encouraging students to undertake individual or team research projects. For more information go to: www.siemens-foundation.org

Andrew Komo, a senior at Montgomery Blair High School in Silver Spring, MD, won the \$100,000 grand prize in the Individual category for developing a coded system that protects online auctions from threats, such as cheating and fraud.

Jillian Parker, a junior at Half Hollow Hills High School West, and **Arooba Ahmed** and **Jiachen Lee**, both juniors at Half Hollow Hills High School East in Dix Hills, NY, shared the \$100,000 grand prize in the Team category for their project which identified a protein that was not previously known to play a role in cell division but could potentially play a role in a number of diseases, including Alzheimer's disease.

Bios, video, and photos available:

<http://siemensusa.synapticdigital.com/US/Siemens-Foundation>

“This year we changed our finalist award structure: first place -- \$100,000, second place - \$50,000, with all other finalists receiving \$25,000,” explained David Etwiler, CEO of the Siemens Foundation. “Seeing the caliber of projects this year, it was clearly the right decision – reflecting an extraordinarily high level across the board from all our students.”

The 2017 Siemens Competition awards were presented at The George Washington University in Washington, DC, host of this year's national finals event. Twenty-one high school competitors – winnowed down from an original pool of more than 2,000 – were judged on their research in topics that addressed issues ranging from better cancer diagnosis to better understanding black holes, and from cybersecurity to preventing deadly hospital infections. More than 1,800 projects were submitted for the competition this year in areas of biochemistry, biology, chemistry, computer science, engineering, environmental science, materials science, mathematics and physics.

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. The competition, administered by Discovery Education, develops a pipeline for the nation's most promising scientists, engineers, and mathematicians.

"All of the competitors' depth of knowledge and ability to grasp complex concepts gives us hope for the next generation of scientists," said Emilia Entcheva, Ph.D., Lead Judge and Professor in the Department of Biomedical Engineering at The George Washington University and a pioneer in the field of cardiac optogenetics.

The Winning Individual

Andrew Komo, a senior from Montgomery Blair High School in Silver Spring, MD, won the individual category and a \$100,000 scholarship for his project entitled, "Cryptographically Secure Proxy Bidding in Ascending Clock Auctions."

Andrew developed a cryptographic protocol designed to protect online auctions from threats including collusion and fraud by ensuring privacy. Bidders' bids are completely private from all other parties until the close of the auction. Despite this, auctioneers can be certain that these hidden bids are valid and know when to draw the auction to a close. The protocol is constructed in such a way that bidders can ensure an auction has run correctly once cryptographic information is revealed at the close of the auction, guaranteeing them an honest purchase price.

"Andrew applied a great combination of mathematics and computer science with a practical application in mind," said William Gasarch, Ph.D., Professor of Computer Science at the University of Maryland in College Park, MD. "People have long thought about this problem but no one has really come up with a clean, fast, user-friendly way of solving it. But Andrew did just that. He has applied techniques of cryptography to the problem of making sure all parties in an online auction are honest and he has implemented it in a way that could be applied soon."

Andrew's system could be used for large-scale auction sites that manage billions of dollars of transactions, often run by governments. Each year, for example, the FCC auctions off bands of

the electromagnetic spectrum to communications and media companies, which need access to this resource for communications such as cell phone, radio, and television broadcasts. With Andrew's system in place, such large-scale auctions could be carried out with more transparency, fairness, and security.

Andrew is passionate about research and aspires to design new algorithms and protocols that make the world safer and more efficient. Outside of his research, Andrew is the captain of his school's computer team and economics club and is an avid tennis player. He was a finalist in the 2017 Moody's Mega Math Challenge, a national team-based math modeling competition, and came in third in the 2016 High School Forensics Challenge, one of the largest high school cybersecurity events.

Andrew's mentor is Lawrence Ausubel, Ph.D., an economist at the University of Maryland.

The Winning Team

Jillian Parker, Arooba Ahmed and Jiachen Lee won the team category and will share a \$100,000 scholarship for their project entitled, "The Cilium and Centrosome Associated Protein CCDC11 is Required for Cytokinesis via Midbody Recruitment of the ESCRT-III Membrane Scission Complex."

Jillian, Arooba and Jiachen found that when the presence of a specific protein (CCDC11) is decreased in a cell, the division of cells that produces new cells cannot be carried out properly. This finding has implications in understanding the genetic basis of many diseases, including neurodegenerative diseases, such as Alzheimer's disease, Amyotrophic Lateral Sclerosis (ALS) and Huntington's disease.

While many proteins are known to be involved in successful cell division, this is the first time that CCDC11 has been shown to be part of this process. CCDC11 is also known to be involved in early development to ensure that organs develop on the correct side of the body. Previous judging noted how this could help us understand how different diseases stem from the same genetic mutation, and alert us to the fact that people who present with one disease or problem might have other seemingly unrelated problems.

"Because of their extensive background research and well-executed set of experiments, Arooba, Jiachen and Jillian found a new function of the protein CCDC11 that could help us better understand complex genetic mutations that affect patients with a number of health issues, including cancer, neurological, and viral diseases," explained competition judge Chadwick Hales, M.D., Ph.D., Assistant Professor of Neurology at Emory University School of Medicine, in Atlanta, GA. "I have no doubt that we will see great things from these young scientists in the future."

Jillian is a junior who is a member of her school's Women in Science and Engineering (WiSE) Club, which she joined because of the underrepresentation of women in STEM fields and the encouragement and opportunities the club offers to young women. Jillian hopes through her exploration of the STEM field, she can become a role model to other young girls and encourage them to take interests in science or math as well. She also dances competitively, golfs, and does community service.

Arooba is a junior and is working towards becoming a cardiologist or researcher. Her interest in science was sparked through visits to museums as a child and she quickly became a consumer of National Geographic and non-fiction literature. She is a cross country runner and participates in her school's speech and debate club. She was an octo-finalist in the New York State Debate Tournament.

Jiachen, also a junior, is fascinated by science with a particular interest in molecular biology and the role of vital molecules in life and disease. She runs track, participates in martial arts, and plays cello in her school orchestra.

The team's mentor is Ken-Ichi Takemaru, Ph.D., of Stony Brook University.

National Finalists

Six individuals and six teams competed at the 2017 Siemens Competition National Finals. The remaining national finalists were awarded the following scholarships:

Individuals:

- **\$50,000 scholarship – Franklyn Wang**, senior at Thomas Jefferson High School for Science and Technology in Alexandria, VA residing in Falls Church
- **\$25,000 scholarship – Brian Huang**, senior at Hunter College High School in New York, NY residing in Fresh Meadows
- **\$25,000 scholarship – Kenneth Jiao**, senior at Indian Springs School in Indian Springs Village, AL residing in Birmingham
- **\$25,000 scholarship – Sriharshita Musunuri**, senior at Henry M. Jackson High School in Mill Creek, WA residing in Mill Creek
- **\$25,000 scholarship -- Neil Wary**, senior at Illinois Mathematics and Science Academy in Aurora, IL residing in Elmhurst

Teams:

- **\$50,000 scholarship – Chelsea Wang**, senior at Fossil Ridge High school in Fort Collins, CO residing in Fort Collins, **Rachel Li**, junior at Spackenkill High School in Poughkeepsie, NY residing in Poughkeepsie and **Jainil Sutaria**, senior at Ardsley High School in Ardsley, NY residing in Ardsley

- **\$25,000 scholarship – Gabrielle Liu**, junior from Ravenwood High School in Brentwood, TN residing in Nashville and **Allen Liu**, senior at McCallie School in Chattanooga, TN residing in Chattanooga.
- **\$25,000 scholarship – Katherine Tian**, junior at The Harker School, San Jose, CA residing in Cupertino and **Swapnil Garg**, senior at The Harker School residing in Sunnyvale
- **\$25,000 scholarship – Anlin Zhang**, senior at Canyon Crest Academy, San Diego, CA, **Rachana Madhukara**, sophomore at Canyon Crest Academy, San Diego, CA, and **Kevin Ren**, senior at Torrey Pines High School in San Diego, CA, all residing in San Diego
- **\$25,000 scholarship – Brandon Zhu and Daniel Zhang**, both seniors at Herbert Henry Dow High School, Midland, MI residing in Midland

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About the Siemens Foundation

The Siemens Foundation has invested more than \$100 million in the United States to advance workforce development and education initiatives in science, technology, engineering, and math. The Siemens 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. For further information, visit www.siemens-foundation.org or follow us on Twitter [@sfoundation](#) or Instagram [@SiemensFdn](#).

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