CEE Alumni Take Top Awards at Intel

Research Science Institute 2014 alumni distinguished themselves again this year in the Intel Science Talent Search (STS). Of the three 1st Place Awards, CEE’s Rickoids took two of the top Honors. Starting this year, the Intel Science Talent Search tripled the scholarship awards to further recognize finalists and highlight the variety of research conducted. Three first-place Medal of Distinction awards of $150,000 were presented to students who showed exceptional scientific potential in three categories: Basic Research, Global Good, and Innovation.

Noah Golowich of Lexington High School in Massachusetts was awarded the First Place Medal of Distinction for Basic Research. Noah developed a proof in the area of Ramsey theory, a field of mathematics based on finding types of structure in large and complicated systems.

Andrew Jin of The Harker School in San Jose, California garnered the First Place Medal of Distinction for Global Good. Andrew developed a machine learning algorithm to identify adaptive mutations across the human genome.

CEE Alumni Win Big at Siemens and Named as Hertz Fellows

The Siemens Competition in Math, Science & Technology, a signature program of the Siemens Foundation, is administered by Discovery Education. Each year high school students submit innovative individual and team research projects to the regional and national levels of competitions. They aspire to receive college scholarship awards ranging from $1,000 to the $100,000. The Hertz Fellowship is awarded annually by the Fannie and John Hertz Foundation. Each fellowship consists of up to 5 years of academic fiscal support valued at $250,000. The Graduate Hertz Fellowship Award is based on merit and is broken down to a cost-of-education allowance and a personal support stipend.

U.S. Flag Waves Proudly With Gold Medal Wins

Each of the four Team USA 2015 members was awarded a Gold Medal at the 26th International Biology Olympiad (IBO) in Aarhus, Denmark, this past summer. Team USA Member, Boyang (Peter) Dun, also placed Second in the World for individual scores at the International Biology Olympiad.

Team USA 2015 Gold Medalists are:
- Grace Chen, Bridgewater-Raritan Regional High School, Bridgewater, New Jersey
- Yilun Du, Pullman High School, Pullman, Washington
- Boyang “Peter” Dun, Canterbury School, Fort Wayne, Indiana
- Varun Mangalick, Mounds View High School, Arden Hills, Minnesota

The mission of the USABO is to encourage excellence in biology education throughout the United States and to challenge students and their teachers to reach the gold standard in biology. Alumni of the USABO have earned MacMillan Grants, Goldwater Scholarships, Hollings Scholarships (National Oceanic and Atmospheric)

(continued on page 3)
Top achieving U.S. and international scholars attended the 32nd annual Research Science Institute (RSI), jointly sponsored by CEE with the Massachusetts Institute of Technology. Students conducted original, cutting edge research in state-of-the-art university laboratories, hospitals, and corporate research facilities.

The students selected for RSI are exemplary as demonstrated by their high school records, personal essays, standardized test scores, teacher recommendations, research experience, potential for leadership, and honors and awards in math and science. RSI scholars participate in college-level research under the mentorship of leading scientists, engineers, and researchers in the Boston area.

The students, dubbed “Rickoids” after the late Admiral H.G. Rickover, Father of the Nuclear Navy and founder of the Center, with CEE President Joann DiGennaro, are studying pure and applied mathematics, physical and biological science, economics, and humanities.

Dr. Andrew Charman, RSI ’86 alumnus and lecturer of physics at University of California, Berkeley, led the RSI 2015. RSI Academic Professors included:

- Dr. Steven Byrnes, RSI’02, Harvard University – Physics
- Dr. Steven Leeb, Massachusetts Institute of Technology – Engineering
- Dr. Forrest Michael, RSI’90, University of Washington - Chemistry
- Dr. Sean Mulholland, Economics, Stonehill College
- Dr. Matthew S. Cain, RSI’97, U.S. Army Natick Soldier Research, Development, and Engineering Center - Biology
- Mr. Lance Rhoades, University of Washington - Humanities
- Dr. Christopher Skinner, RSI’88, Princeton University - Mathematics

Thirty-two international students from Australia, Brazil, Bulgaria, Canada, China, Israel, Lebanon, Poland, Saudi Arabia, Singapore, South Korea, Spain, Sweden, Switzerland, and Turkey joined the U.S. students.

The RSI’ 2015 Closing Keynote Address was presented by The Honorable Clarine Nardi Riddle, CEE Trustee and Counsel at Kasowitz Benson Torrres & Friedman, LLP.

RSI is offered cost-free by CEE to competitively selected top achieving students in science, technology, engineering, and mathematics (STEM) through collaborations with educational institutions, private foundations, corporations, government agencies, and individuals who share a commitment to educational excellence and leadership. RSI has nearly 2,300 successful alumni with an 80% STEM career retention rate of the alumni.

2015 RSI Closing Keynote Address presented by Clarine Nardi Riddle, CEE Trustee.
### Written

Abijith Krishnan - Arizona, BASIS Scottsdale High School
- A Secretary Problem with a Sliding Window for Recalling Applicants
- Under the guidance of Dr. Shan-Yuan Ho (Massachusetts Institute of Technology)

Kristine Zhang - California, Saratoga High School
- Fracture Mechanics of Monolayer Molybdenum Disulfide using Molecular Dynamics
- Under the guidance of Mr. GangSeob Jung (Department of Civil and Environmental Engineering, Massachusetts Institute of Technology)

Yo-whan John Kim - Republic of Korea, Seoul International School
- Improving Gesture Interface Using Bayesian Network Structure Learning and Non-parametric Modeling
- Under the guidance of Dr. Vikash Mansinghka (Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, Computer Science and Artificial Intelligence Laboratory)

### Oral

Sahaj Garg - New Jersey, Bridgewater-Raritan High School
- Perception and Interpretation of Dynamic Imagery
- Under the guidance of Dr. Jeremy Wolfe (Brigham and Women’s Hospital)

Venkatesh Sivaraman - Ohio, Bexley High School
- Simplified Audio Production: Live Voice Editing Based on Speech-to-Text Transcription
- Under the guidance of Dongwook Yoon (Cornell University, edX)

Victoria Emily Buckland - Singapore, National Junior College
- Design of an Economic and Passive Daylighting System
- Under the guidance of Professor Mara Prentiss (Harvard University)

### Oral & Written

Amol Punjabi - Massachusetts, Massachusetts Academy of Math and Science
- Discovering Druggable Binding Sites on Intrinsically Disordered Proteins
- Under the guidance of Dr. Gil Alterovitz (Boston Children’s Hospital)

Claire Burch - California, Mira Loma High School
- Detection and Characterization of Candidate Exoplanetary Systems using Gravitational Lensing Events
- Under the guidance of Dr. Rosanne Di Stefano (Cambridge, Massachusetts, Department of High Energy Astrophysics, Harvard-Smithsonian Center for Astrophysics)

### RICKOID of the Year

Award given by peers to David Zhao of Lakeside Upper School in Seattle, Washington at RSI in honor of Admiral H.G. Rickover, Father of the Nuclear Navy and Civilian Uses of Nuclear Power.

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"Only 42% of this year’s college-bound seniors met the SAT College and Career Readiness Benchmark. This number has been on the decline over the last five years."

Ed Review September 2015
U.S. Department of Education

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CEE Alumni Take Top Awards at Intel
(from page 1)

Shashwat Kishore of Unionville High School in Kennett Square, PA received the Third Place Medal of Distinction for Basic Research. Shashwat’s math project focused on a new relationship between these matrices and topology.

Anvita Gupta of BASIS Scottsdale High School in Scottsdale, Arizona also received the Third Place Medal of Distinction for Global Good. Anvita used machine learning to “teach” a computer to identify potential drugs for cancer, tuberculosis and Ebola.

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U.S. Flag Waves Proudly With Gold Medal Wins
(from page 1)

Administration), American Heart Association Undergraduate Fellowships, National Science Foundation Fellowships, The Paul and Daisy Soros Fellowship for New Americans, the Linen Prize in Chinese, and the Clara Levillain Prize. They have also received accolades as Marshall Scholars and Churchill Scholars.

During the two weeks at Purdue, the finalists participated in intensive theoretical and practical tutorials. The high school students studied with leading U.S. biologists who are experts in the fields of cellular & molecular biology, plant anatomy & physiology, animal anatomy & physiology, ethology, genetics & evolution, ecology, ethology, and biosystematics.
Saudi Arabia Research Science Initiative – First STEM Program in Kingdom to Focus on Young Females

The Research Science Initiative (RSI) at the University of Dammam in Saudi Arabia was sponsored in partnership with the Center for Excellence in Education (CEE), Saudi Aramco and The King Abdulaziz and His Companions Foundation for Giftedness and Creativity (MAWHIBA). It served high-achieving middle school girls. RSI encouraged science, technology, engineering and mathematical (STEM) studies. CEE was chosen by Saudi Aramco to implement the Initiative as a result of its partnership which established the Research Science Institute at KAUST for male and female high school scholars to study together.

The unparalleled academic program provided rigorous instruction, individualized mentorships and laboratory experiences for young female scholars. The Initiative, a 5 week program, was led by Dr. Amy Sillman, RSI’84 with Dr. Hanadi Baghdadi, University of Dammam. Dr. Jenny Sendova, Associate Professor at the Institute of Mathematics and Informatics, Bulgarian Academy of Sciences (BAS) was the Lead Tutor.

CEE proudly welcomes the SA-RSI female alumni to a community of over 2,000 alumni from around the world. SA-RSI alumni with have a lifetime opportunity to network with each other, to participate and assist with year 2 of SA-RSI, and to network with other RSI scholars in the U.S., China, Bulgaria, and India STEM Initiatives.

CEE introduces the Research Science Initiative at Tsinghua University in China

In partnership with Tsinghua University (Tsinghua), CEE inaugurated the Research Science Initiative 2015 this past summer. This is the first research program that Tsinghua has sponsored with a U.S. organization to focus on high ability high school students.

Professor Benjamin Koo was the Executive Director of RSI. He is an Associate Professor in the Department of Industrial Engineering at Tsinghua University. Robert Rhew, Associate Professor, Department of Environmental Science, Policy, and Management at the University of California Berkeley and RSI’87 alum, and Chee-Kiang Lim, Consultant and RSI’89, were Co-Directors of the program.

Students from throughout China were competitively selected to attend college-level classes taught by distinguished professors from Tsinghua University and visiting U.S. professors from leading institutions.

Professors leading the students at Tsinghua University are:
- Mr. Justin Komisarof, RSI’04 MD/PhD Student at University of Rochester Medical Center – Biology
- Dr. Forrest Michael, RSI’90, University of Washington – Chemistry
- Mr. Lance Rhoades, University of Washington – Humanities
- Dr. Edward Su, RSI’02, Independent Consultant – Physics
- Dr. Bai Fengshan, Tsinghua University – Mathematics
- Dr. Tsai Wei-Tek, Tsinghua University – Engineering

Former alumni of the U.S. based Research Science Institute and the USA Biology Olympiad, along with staff members from Tsinghua University, were tutors and counselors to the scholars.

CEE was proud to host and to nurture the students from throughout China at RSI Tsinghua 2015.

"Hide not your talents… What’s a sundial in the shade?"

Benjamin Franklin

Dr. Jenny Sendova with SA-RSI scholar.
CEE Alumni Win Big at Siemens and Named as Hertz Fellows (from page 1)

CEE Alumni Siemens Awardees:

Peter Tian, 2014 Research Science Institute Alumnus, was awarded the $100,000 Grand Prize in the Individual Category at the Siemens Competition. His project focused on mathematical research on pattern avoidance for multidimensional matrices and was titled *External Functions of Forbidden Multidimensional Matrices*.

Anvita Gupta, RSI’14 Alumna, garnered a $10,000 Siemens scholarship for her research, *A Novel Method for Targeting Intrinsically Disordered Proteins for Drug Discovery: Application to Cancer and Tuberculosis*.

CEE Alumni Hertz Fellows:

Congratulations to Katherine Xue, USA Biology Olympiad (USABO) 2008, and Maxim Rabinovich, Research Science Institute (RSI) 2008, named 2015 Hertz Fellows. They will continue to pursue the answers to the "Big Challenges" in science as Hertz Fellows.

Katherine is a PhD candidate studying biology and genome sciences at Washington University. Her goal is to harness the power of genomic technologies to understand evolutionary forces and their lasting effects.

“Scientific literacy is incredibly important in today’s society—it informs decisions ranging from everyday choices to issues of international importance,” said Katherine Xue. “I think that scientists have a responsibility to communicate to the public not only about scientific findings, but also about scientific ways of thinking.”

Maxim is pursuing his PhD in computer sciences at University of California Berkeley. He is researching machine learning and natural language processing and hopes to develop artificial intelligence tools that support and extend human reasoning.

“The scientific community needs tools, and that’s a big part of what artificial intelligence can offer,” said Maxim Rabinovich. “I’m interested in building more efficient ways to gather and process information. One of the great things about the Hertz Fellowship is that it puts an emphasis on going out in the world and using science to do interesting things.”

Peter, Anvita, Katherine, and Maxim are examples of the fine scholarship of the Center for Excellence in Education’s program alumni.

CEE Thank You

Enthusiastic RSI and USABO Alumni gathered in an event at the home of Cynthia Pickett-Stevenson and her husband, Don, in Houston, Texas. Cynthia is a member of CEE’s Board of Trustees.

Some guests, left to right: Dr. Soham Roy RSI’86, Siddarth Guha USABO’14, Steve Fast RSI’88, Ms. D, Beebe Parker RSI’06, Ms. Cynthia Pickett-Stevenson, and Matt Thrasher, Ph.D., RSI’98.

“Students who had participated in an accelerated summer program continued a pattern of high academic achievement throughout high school and college. Students, especially females, who took a mathematics class benefitted more than students who took other subjects in the summer.”


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Center for Excellence in Education www.cee.org

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CEE Congressional Luncheon

The Kennedy Caucus Room, one of the grandest and most historic rooms in the nation’s Capital, was the setting of the annual CEE Congressional Luncheon sponsored by Capital One Bank. The event honored corporate donors and friends of CEE, highlighted the Center’s programs and alumni, and celebrated the Senator Joseph I. Lieberman Awardee for Outstanding Achievement in Science and Technology.

Dr. Feng Zhang, RSI’99 was recognized as the recipient of the Joseph I. Lieberman Award for Outstanding Achievement in Science and received a $10,000 prize. This special honor is given by CEE every other year in appreciation of Senator Joseph Lieberman’s service as a CEE Trustee for 17 years and his steadfast commitment to science, technology, engineering, and math (STEM) education.

Dr. Zhang is a Core Member of the Broad Institute of MIT and Harvard, an investigator at the McGovern Institute for Brain Research at MIT, and an Assistant Professor at MIT with a Joint Appointment in the Departments of Brain and Cognitive Sciences and Biological Engineering. He is designing new molecular tools for manipulating the living brain. He is a leader in the development of the CRISPR-Cas9 system, a genome editing technology that allows scientists to make precise changes to a DNA sequence. Dr. Zhang’s scientific advance is expected to transform many areas of biomedical research and lead to the basis of new treatments for human genetic disease. Feng shared the UNC/Perl Prize for his role in the development of optogenetics in 2012.

Dr. Feng Zhang was presented with the Senator Lieberman Award and $10,000 Prize by Mel Chaskin, Chairman of the CEE Board of Trustees, was with Joann DiGennaro, CEE’s President.

Noah Golowich, RSI’14

Noah Golowich, Research Science Institute RSI’14 alumnus and one of the 1st place Intel Award winners, was a featured speaker. “During RSI, I had the opportunity to work with MIT faculty on fascinating mathematical problems, to listen to a variety of scientists’ lectures about their groundbreaking work, and of course, to meet 82 other talented high school students from around the world.”

Jonathan Gootenberg, IBO’08 & ’09

A PhD student in systems biology at Harvard University and a 2 time Gold Medalist at the International Biology Olympiad ’08 and ’09, Jonathan Gootenberg addressed the audience and explained his journey. He is a scientist in the Feng Zhang Lab at the Broad Institute where he is designing experiments to assess and characterize various genome-editing approaches.

Senator Bill Nelson

Senator Bill Nelson, Honorary Member of CEE’s Board of Trustees, emphasized the importance of steering children towards pursuing careers in STEM education. “One issue that’s central to our future is the education of our children.”

“I am truly ‘blown away’ by the achievements and significant breakthroughs by Dr. Zhang in not just one, but two different fields of study and inquiry. His work in ‘optogenetics’ and genetic engineering is charting new paths that will have transformative impacts on future research for many years to come. Thank you, Dr. Zhang, for leading the way and for bringing your talents to bear through your novel technologies in the study and treatment of diseases.” Excerpt of letter from Senator Joseph Lieberman, presented by The Honorable Clarine Nardi Riddle, CEE Trustee and former Chief of Staff to the Senator.
Don’t Leave the Best Behind
By Joann DiGennaro, President of CEE

Believe it or not, there are some places where it’s now politically incorrect to refer to top students as gifted and talented.

I wonder what alternatives would be okay – differently-abled? Special needs students? Above bright? These terms are ridiculous.

So, too, is it ridiculous to contend that all of us are of equal ability in academics or anything else. So I implore the adrift educational transformers to stop the clinical claptrap that “all students are gifted and talented.”

The late Julian C. Stanley, founder of the Center for Talented Youth at Johns Hopkins University, identified that the super achievers are 1 in 10,000 students, have an IQ above 140, and are able to complete a year and a half’s worth of math work in three weeks. Norm Augustine, in his seminal “Beyond the Gathering Storm,” reported that these students can often do the work of four individuals.

For more than three decades, the Center for Excellence in Education (CEE) has been providing opportunities and activities to stretch the minds of these talented young scholars here in America.

Our nation faces stiff global competition when it comes to 21st Century challenges. Will our scholars make the scientific breakthroughs to meet the needs in health, energy, the environment, agriculture, and national security?

Unfortunately, scant attention is given in the U.S. to maximize the potential of students with demonstrated academic excellence to make a difference.

Singapore, China, and Korea are examples of nations that concentrate on training their most promising achievers while providing opportunities for all other students. These countries also excel on international high school math and science tests. It’s no coincidence that they are emerging economic powerhouses as well.

If the U.S. is to maintain its economic prosperity and global leadership, it must recognize that gifted and talented students must be identified early and nurtured through elementary and secondary school. Teacher training and professional development to identify and assist outstanding academic achievers must be mandated for all elementary and secondary educators.

One thing we know is that achievers and future leaders in science and technology come from all backgrounds and are not restricted to economic status, gender, or race. They are to be found in diverse schools across the country. Let’s find them and give them the support they need.

Knowledge about talent development suggests that gifted children thrive when given the opportunity to explore their curiosity at a pace that works for them. Accelerated coursework and enrichment programs are critical to the success of such students . . . It’s a myth that gifted children would thrive no matter what their learning environment.”

Camilla Benbow, New York Times op-ed, Challenge Highly Talented Children

Camilla Benbow, New York Times op-ed Challenge Highly Talented Children. She is the Patricia and Rodes Hart Dean of Education and Human Development at Vanderbilt University’s Peabody College.
About the Center for Excellence in Education

The Center for Excellence in Education (CEE) nurtures high school and university scholars to careers of excellence and leadership in science, technology, engineering, and math (STEM) and encourages collaborations between and among leaders in the global community.

 Founded in 1983 by the late Admiral H.G. Rickover and Joann DiGennaro, President of the Center for Excellence in Education, the Center’s programs help keep the United States competitive in science and technology. CEE challenges young scholars and assists them on a long-term basis to become the creators, inventors, scientists, and leaders of the 21st century.

As a private non-profit organization, CEE is not subject to federal and state mandates or political pressures. All CEE programs are open to students and teachers, at no cost to them, regardless of race, color, creed, or economic background; the only criterion is academic excellence.

CEE sponsors the Research Science Institute (RSI), the USA Biology Olympiad (USABO), and the Teacher Enrichment Program (TEP).

To date, CEE has received funds from the U.S. Department of State, the U.S. Agency for International Development, the National Science Foundation, the National Endowment for the Humanities, the National Security Agency, the Bureau of Indian Affairs, the Department of Agriculture, the Department of Energy, and the Department of Defense. Private individuals and corporations, however, provide most of CEE’s funding.

FALL 2015

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