

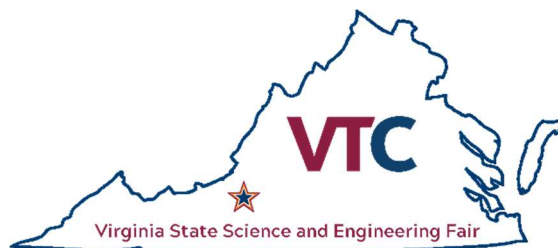
Virginia State Science and Engineering Fair (VSSEF) winners announced

[Note: Images may be found at medicine.vtc.vt.edu/vssef]

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(Roanoke) More than 270 students from across the commonwealth competed in the Virginia State Science and Engineering Fair (VSSEF) April 6, 2019 in Roanoke, Virginia. The event was held at the Berglund Center and hosted by the Virginia Tech Carilion School of Medicine.



The Governor's Award and grand prize went to Mary Grace Giles from the Roanoke Valley Governor's School/Patrick Henry High School in the Western Virginia Region for her project titled, "Evaluating the Impact of Coal Ash Pollution through a *C. elegans* Developmental Model." Her project was also first-place winner for the category, Earth and Environmental Sciences.

The second-place grand prize went to Rose Tomiak from the Southwest Virginia Governor's School in the Blue Ridge Highlands Region for her project titled, "Analyzing the Difference in the Sorption Concentrations of Copper, Lead, Iron and Zinc in Polyactic Acid and High Density Polyethylene Plastic Bags." Her project was also first-place winner for the category, Chemistry.

The third grand prize went to three individual student projects. The first third-place grand prize went to Allison Stocks from Yorktown High School in the Northern Virginia Region for her project titled, "The Effect of Architectural Design on Supertall Building Flutter Acceleration." She also won first place in the Engineering Mechanics category. The second third-place grand prize went to Justin Hu from James Madison High School in the Fairfax County Region for his project titled "Using Self Assembled Monolayers for the Fabrication of Implantable Strain Gauge Sensors." He also won first place in the category, Materials Science. The final third-place grand prize winner was Logan Dunkenberger from the Roanoke Valley Governor's School in the Western Virginia Region for her project titled, "Dynamic Roles of Epstein-Barr Virus Reactivation: Identifying novel mechanisms for EBV-positive lymphoma progression and treatment." She was also the first-place winner in the category, Cellular and Molecular Biology.

Category Winners

Animal Sciences

- First: Korrina Gidwani; Thomas Jefferson High School for Science and Technology, Fairfax County Region, "The Effect of Humidity on the Madagascar Hissing Cockroach Reproduction Cycle"
- Second: Tessa Naughton-Rockwell; TC Williams High School, Northern Virginia Region, "Saving the Bees: The Correlation of Internal Beehive Temperature and Neonicotinoid Residues"
- Third: Alexandria Perez; Frank W. Cox High School, Tidewater Region, "Electronic cigarette (JULL) vapor effect on In-Vitro Fertilization of Sea Urchin Gametes"
- Honorable Mention: Morgan Ralph; Southwest Virginia Governor's School, Blue Ridge Region, "The Effect of Humidity on the Madagascar Hissing Cockroach Reproduction Cycle"

Behavioral and Social Sciences

- First: Victoria Graf; Thomas Jefferson High School for Science and Technology, Fairfax County Region, "Localizing Neurological Response Entropy from Music Stimuli through Assessment of Memory and Training Effects via Wavelet EEG Analysis"

- Second: Pierce Corson; Ocean Lakes High School, Tidewater Region; “Giving Teens a Voice: Sources of Stress for High Schoolers”
- Third: Lindsey Wang; Chantilly High School, Fairfax County Region, “The Effect of Sentence Characteristics on Readability and Text Ranking”
- Honorable Mention: Elysia Lin and Madison Stein; Roanoke Valley Governor's School/Franklin County High School, Western Virginia Region, “Goal-oriented Episodic Future Thinking and Delay Discounting in an Obese Population”

Biochemistry

- First: Junhyun Chong; Thomas Jefferson High School for Science and Technology, Fairfax County Region, “A chemiluminescent dual-aptasensor capable of simultaneously quantifying prostate specific antigen and vascular endothelial growth factor”
- Second: Anirudh Gadicherla and Joseph Nguyen; Briar Woods High School, Loudoun Region, “Effect of Eucalyptol on the Aggregation of Alpha-Synuclein in C. elegans Model of Parkinson’s Disease”
- Third: Solomon Hutchins and Noa Yager; James Madison High School, Fairfax County Region, “Quantifying the Amount of Capsaicin in Varying Types of Peppers:”
- Honorable Mention: Williams Luqiu; Roanoke Valley Governor's School/Cave Spring High School, Western Virginia Region, “A Novel Computational Approach to Structural Analysis of p53: A Breakthrough in Small Particle Reconstruction”

Biomedical and Health Sciences

- First: Amber Gulati; Academies of Loudoun, Loudoun County Region, “Fucoidan's Effect on Lewy Body Dementia”
- Second: Anusha Puri; Mills E. Godwin High School, Metro Richmond Region, “Knockout of AEG-1 Promotes Sensitivity to Sorafenib in Human Hepalocellular Carcinoma”
- Third: Soumya Pondugula; Academies of Loudoun, Loudoun County Region, “Determining the Effects of L. casei on the Reduced Glutathione Levels of a C. elegans Model of Parkinson's Disease”
- Honorable Mention: Luke Hatch; Central Virginia Governor's School/Jefferson Forest High School, Central Virginia Region, “The Effect of Auricle Shape and Angle of Hearing on the Amplification of Sound”

Cellular and Molecular Biology

- First: Logan Dunkenberger (Third Grand Prize Winner-see information above)
- Second: Perisa Ashar; Maggie L. Walker Governor School, Metro Richmond STEM Fair, "In-Vitro Patch-Clamp Study of the Ih Current in Mice Thalamus Neurons Including Finding Novel Electrophysiological Biomarkers for Autism Spectrum Disorders”
- Third: Claire Morton; Blacksburg High School, Blue Ridge Highlands Region, “The Relationship Between Codon Usage Bias, mRNA Half-Life, and the Ste 13 Protein”
- Honorable Mention: Shayom Debopadhaya; Roanoke Valley Governor's School/Salem High School, Western Virginia Region, “The role of QSOX1 in skeletal muscle and at neuromuscular junctions”

Chemistry

- First: Rose Tomiak, (Second Grand Prize Winner – see information above)
- Second: Carly Smith; Roanoke Valley Governor's School/Franklin County High School, Western Virginia Region, “The Removal of Azo Dyes from Water Using Chitosan Based Materials”
- Third: Madison Nichols and John Sykes Richardson; Massanutten Regional Governor's School, Shenandoah Valley Region, “Activated Carbon Foam Surfaced Carbon dioxide scrubber with an environmentally sustainable gas purification system using bicarbonate ions”

- Honorable Mention: Uyen Tran; Roanoke Valley Governor's School/William Fleming High School, Western Virginia Region, "The Investigation of Lead Corrosion Using Atomic Microscopy"

Computational Biology and Bioinformatics

- First: Neeyanth Kopparapu; Thomas Jefferson High School for Science and Technology, Fairfax County Region, "MRI Image Synthesis for the Diagnosis of Parkinson's Disease using Deep Learning"
- Second: Aria Moss and Svetlana Pack; Thomas Jefferson High School for Science and Technology, Fairfax County Region, "Order within the Chaos: A Data-Based Approach to Clarifying the Effect of Seizure Etiology on Seizure Cycle Parameters in Epileptic Patients"
- Third: David Toomer; Hayfield Secondary School, Fairfax County Region, "CeRNetwork: A Platform for in silico Discovery and Classification of Competing Endogenous RNA Sequences for Multi-Omic Network Diffusion and Novel miRNA-Sequestering Drug Design"
- Honorable Mention: Brandon Fan; Blacksburg High School, Blue Ridge Highlands Region, "An AI-based System for Discovering Potential Adverse Drug Events Using Open Data"

Earth and Environmental Sciences

- First: Mary Grace Giles (Governor's Award and Grand Prize Winner-see information above)
- Second: Ankisha Singh; Oakton High School, Fairfax County Region, "The Effect of Cilantro vs Standard Water Purification Methods on Water Quality"
- Third: Kunika Tiwari; Roanoke Valley Governor's School/Patrick Henry High School, Western Virginia Region, "The Impact of Aluminum and Silver Nanoparticles on Plants and Daphnia"
- Honorable Mention: Grace Kirkpatrick; Mountain View High School, Virginia Piedmont Region, "The Study of Radiation Emission from Coal and Nuclear Power Plants"

Energy: Chemical and Physical

- First: James Li and Konrad Siebor; Academies of Loudoun, Loudoun County Region, "Improving the Properties of Thermal Materials by Modulating Substrate Surface Geometry."
- Second: Kaien Yang; Fairfax County Region, "Discovery of FAZnF₃, an HOIP for Water Splitting"
- Third: Peneeta Wojcik; Governor's School for Science and Technology, Tidewater Region, "The Effect of the Plating Time of Cobalt Nitrate on the Efficiency of an Electrochemical Cell"
- Honorable Mention: Hari Raman; Westfield High School, Fairfax County Region, "The effect of different salt-to-water ratios on a salt-water powered car"

Environmental Engineering

- First: Adithya Iyer; Roanoke Valley Governor's School/William Byrd High School, Western Virginia Region, "A Colorimetric *int11* gene Gold Nanosensor for Monitoring Environmental Wastewater Pollution"
- Second: James Licato; Washington-Lee High School, Northern Virginia Region, "Optimizing Metformin Removal: Utilizing Molecular Sieves and Absorbents Within Sand Filtration Units"
- Third: Ashish Pothireddy and Clarence Ramirez; Osbourn Park High School, Prince William-Manassas Region, "The Effect of Different Hydroxide Solutions on Atmospheric Carbon Capture"
- Honorable Mention: Janine Icalla; Mills E. Godwin High School, Metro Richmond Region, "Using Waste Biomass-Based Electrodes by Electrocoagulation for the Simultaneous Removal of Lead and Phosphate from Water"

Engineering Mechanics

- First: Allison Stocks; (Third Grand Prize Winner-see information above)
- Second: Tarun Golla and Adithya Muralikrishna; Academies of Loudoun, Loudoun County Region, "Investigating the Effect of Surface Textures on the Stall of Elliptical Wings"

- Third: Jason Chen; Thomas Jefferson High School for Science and Technology, Fairfax Region, “Optimization of a Methalox Rocket Engine”

Mathematics

- First: Maria Stuebner; Governor's School for Science and Technology, Tidewater Region, “Combatting Gerrymandering Using Mathematical Methods to Define Compactness and Account for Natural Boundaries”
- Second: Derek Sprincis; Mountain Vista Governor's School, Shenandoah Valley Region, “Determining biases in public goods via water main break analysis”
- Third: Rayan Yu; James Madison High School, Fairfax County Region, “Applying Clustering Algorithms to Classify and For Forecast Financial Time-Series”

Materials Science

- First: Justin Hu; (Third Grand Prize Winner, see information above)
- Second: Srijia Pinnamaneni; Academies of Loudoun, Loudoun County Region, “Electrospinning PVAc meshes for ibuprofen delivery”
- Third: Isabella Burgoyne; Blue Ridge Highlands Region, “Testing the Oil Absorption of a Cellulose Barrier on Cardboard”
- Honorable Mention: Himagowri Prasad; York High School, Tidewater Region, “Novel magneto-optic materials for bio-medical imaging applications”

Microbiology

- First: Miamar Burgos-Rosario, Saijai Supankling, and Sarah Syed; Hayfield Secondary School, Fairfax County Region, “Cyanocide: A Novel Strategy for Harmful Algal Bloom Mitigation via Initiation of Programmed Cell” Death”
- Second: David Kang; J.R. Tucker High School, Metro Richmond Region, “The Inhibition of Methane-Producing Bacteria using Novel Compound B-Carboline”
- Third: Madeleine Edwards and Nikhila Akula; Academy of Engineering and Technology, Loudoun County Region, “A Novel Method to Remove Bacterial Biofilms in the Human Conditions through the Use of eDNAse with Escherichia coli and Staphylococcus epidermidis”
- Honorable Mention: Sanika Karandikar; Thomas Jefferson High School for Science and Technology, Fairfax County Region, “The Efficacy of Photosensitizer Mediated Photodynamic Treatment in Eradicating Staphylococcus epidermidis Biofilms”

Physics and Astronomy

- First: Abhishek Allamsetty; Thomas Jefferson High School for Science and Technology, Fairfax County Region, “A Novel Machine Learning Toric Decoder for Rapid Quantum Error Correction”
- Second: Luke Mrini ; Fairfax County Region, “Modelling Energy Extraction in Analog Black Holes”
- Third: Laurel Logan; Central Virginia Governor's School/ E.C. Glass High School, Central Virginia Region, “The Effect of Different Types of Glass on the Speed of Light”
- Honorable Mention: Caleb Schear; Tuscarora High School, Loudoun County Region, “Superconducting Effects on External Magnetic Field”

Plant Sciences

- First: Sophia Link; Blacksburg High School, Blue Ridge Highlands Region, “The Role of the IPK1 and ITPK1 Genes in Plant Sucrose Sensing”

- Second: Anna Xu; Thomas Jefferson High School for Science and Technology, Fairfax County Region, “Selective sweeps and genomic differentiation between northern and southern populations of the woodland strawberry (*Fragaria vesca*).”
- Third: Ryan Mollin; Roanoke Valley Governor's School/Franklin County High School, Western Virginia Region, “The Allopathic Effect of *C. verum* on the Germination of *P. oleracea*”
- Honorable Mention: Akkalar Hassita; Goodwin High School, Metro Richmond Region, "The Effect of Various Heavy Metals on the Mortality of Plant Root Border Cells”

Systems Software and Intelligent Machines

- First: Soumya Mishra; Academies of Loudoun, Loudoun County Region, “Solving Big Data Bottlenecks and Optimizing Apache Spark Using a Statistical Distribution Sorting Method”
- Second: Divjot Bedi and Rishabh Misra, Thomas Jefferson High School for Science and Technology, Fairfax County Region, “BMCI-Net: A Novel Approach to Non-Invasive, Fully Mobile Prosthetic Control Using Robust Pa em Detection and Fllralx,n of EMG end EEG Signals Through Supervised Machine Learning”
- Third: Avyuk Dixit, Saketh Gabbita and Havish Malladi; Thomas Jefferson High School for Science and Technology, Fairfax County Region, “A Novel Approach to Contextual Violence Detection”
- Honorable Mention: Nicole Seman; Academies of Loudoun, Loudoun County Region, “The Effect of Granule Clustering on the Holding Force of Shape-agnostic Jamming- grippers”

Special Awards

Student participants were also eligible for a number of special awards, given by sponsors and organizations. Winners were selected based on the criteria of each award.

The American Meteorological Society awards certificates to the two-best meteorological-related projects:

- Mikhail Mints; McLean High School; Fairfax County Region
- Youran Gao; Ocean Lakes High School, Tidewater Region

The American Psychological Association awards a certificate of outstanding research in psychology in the category of Behavioral and Social Sciences.

- Savannah Spencer; Southwest Virginia Governor's School, Blue Ridge Highlands Region

The American Water Works Association-Virginia Section presents a certificate and monetary prize for three projects related to water or that address drinking water issues.

- James Licato; Washington-Lee High School, Northern Virginia Region
- Saijai Supanklang, Miamar Burgos-Rosario and Sarah Syed; Hayfield Secondary School, Fairfax County Region
- Carly Smith; Roanoke Valley Governor's School/Franklin County High School, Western Virginia Region

ASM Materials Education Foundation awards a certificate and medallion to the best materials engineering project.

- Himagowri Prasad; York High School, Tidewater Region

The Association for Women Geoscientists awards a certificate to a female student whose project exemplifies high standards of innovativeness and scientific excellence in the geosciences.

- Grace Kirkpatrick; Mountain View High School; Virginia Piedmont Region

The International Council of System Engineers (INCOSE) Central Virginia Chapter awards certificates and monetary prizes for three projects that show the greatest innovation without the support of funding of professional laboratories or advisors.

- First: Soumya Mishra; Academies of Loudoun; Loudoun County Region
- Second: Avyuk Dixit, Havish Malladi and Saketh Gabbita; Thomas Jefferson High School for Science and Technology, Fairfax County Region
- Third: Rishabh Misra and Divjot Bedi; Thomas Jefferson High School for Science and Technology, Fairfax County Region

The Intel Excellence in Computer Science awards a certificate and monetary prize to the most outstanding computer science project.

- Timothy Hannan; Central Virginia Governor's School/Heritage High School; Central Virginia Region

The Leidos Corporation offers monetary awards in the fields of microbiology, physics/astronomy, applied science, and computational science.

- First Place (Applied): Caroline Cunningham; Washington-Lee High School; Northern Virginia Region
- Second Place (Applied): Sophia Goldbeck and Christopher Nguyen; Academies of Loudoun, Loudoun County Region
- Third Place (Applied): Nicole Seman; Academies of Loudoun, Loudoun County Region
- First Place (Computational): Kevin Sheng; Roanoke Valley Governor's School/Cave Spring High School, Western Virginia Region
- Second Place (Computational): Maria Stuebner; Governor's School for Science and Technology, Tidewater Region
- Third Place (Computational): Soumya Mishra; Academies of Loudoun, Loudoun County Region
- Leidos Young Virginia Researcher: Neeyanth Kopparapu, Thomas Jefferson High School for Science and Technology, Fairfax County Region
- Honorable Mentions:
 - Ishan Kalburge; Wilbert Tucker Woodson High School, Fairfax County Region
 - Agah Ebrahimi; Wilbert Tucker Woodson High School, Fairfax County Region
 - Neal Bayya; Thomas Jefferson High School for Science and Technology, Fairfax County Region
 - George Tang; Thomas Jefferson High School for Science and Technology, Fairfax County Region
 - Alexandra Barrett; Southwest Virginia Governor's School, Blue Ridge Highlands Region
 - Ghedion Beyen; Osbourn Park High School, Prince William-Manassas Region
 - Khoi Nguyen; Osbourn Park High School, Prince William-Manassas Region
 - Sulav Regmi; Osbourn Park High School, Prince William-Manassas Region
 - Joshua Salazar; James Madison High School, Prince William-Manassas Region
 - Jason Chen; Thomas Jefferson High School for Science and Technology, Fairfax County Region
 - Avyhuk Dixit; Thomas Jefferson High School for Science and Technology, Fairfax County Region
 - Havish Malladi; Thomas Jefferson High School for Science and Technology, Fairfax County Region

- Saketh Gabbita; Thomas Jefferson High School for Science and Technology, Fairfax County Region
- Jacob Lear; Academy of Engineering and Technology/John Champe High School, Loudoun County Region
- Bhavna Prakash; Academy of Engineering and Technology/John Champe High School, Loudoun County Region
- Brandon Fan; Blacksburg High School, Blue Ridge Highlands Region

Mu Alpha Theta awards a certificate to the project that demonstrates the most challenging, original, thorough, and creative investigation of a problem involving modern mathematics.

- Shannon Gallagher; South Lakes High School; Fairfax County Region

The NASA Earth System Science Award recognizes outstanding projects relating to earth system science, particularly one offering the greatest insight into the earth's interconnected systems.

- Medha Majety; Mills E. Godwin High School, Metro Richmond Region

The NOAA Pulse of the Planet goes to a student whose research emphasizes their mission of keeping citizens informed of the changing environment around them.

- Janine Icalla; Mills E. Godwin High School, Metro Richmond Region

The Office of Naval Research plans, executes, coordinates, and promotes science and technology for the US Navy and Marine Corps through work performed at universities, naval laboratories, and industrial research centers. The office recognizes three projects.

- Akshay Subramaniam; Oakton High School; Fairfax County Region
- Alexander Burkhart; Laurel Springs Academy; Virginia Piedmont Region
- Youran Gao; Ocean Lakes High School, Tidewater Region

The Ricoh Sustainable Development Award recognizes one innovative project which best reflects the principles of sustainability.

- Isabella Burgoyne; Blue Ridge Highlands Region

The Society for In Vitro Biology awards a certificate to a high school junior in the category of plant or animal in vitro biology or tissue culture.

- Logan Dunkenberger; Roanoke Valley Governor's School/Glenvar High School, Western Virginia Region

The Stockholm Junior Water Prize awards certificates to the top three most outstanding water-related research projects.

- James Licato; Washington-Lee High School; Northern Virginia Region
- Emma Wunderly; Mountain View High School, Virginia Piedmont Region
- Sydney Bell; T.C. Williams High School, Northern Virginia Region

The U.S. Air Force recognizes projects in math, science, and engineering that offer Air Force applicability.

- Soumya Mishra; Academies of Loudoun, Loudoun County Region
- Tarun Golla; Academies of Loudoun, Loudoun County Region
- Caleb Schear; Tuscarora High School; Loudoun County Region
- Luke Mrini; Fairfax County Region

The U.S. Metric Association Award recognizes a project involving significant quantitative measurement and which best uses the SI metric system.

- Isha Bhangui; Academies of Loudoun, Loudoun County Region
- Medhini Sosale; Academies of Loudoun, Loudoun County Region

The Virginia Bioscience Foundation presents prizes for projects related to biological sciences.

- First: Neeyanth Kopparapu; Thomas Jefferson High School for Science and Technology; Fairfax County Region
- Second: Junhyun Chong; Thomas Jefferson High School for Science and Technology, Fairfax County Region
- Third: David Toomer; Hayfield Secondary School; Fairfax County Region

The Virginia Dental Association promotes dentistry to their communities' science-talented students.

- Bennet Malbon Grand Prize: Logan Dunkenberger; Roanoke Valley Governor's School/Glenvar High School, Western Virginia Region
- Animal Sciences: Korrina Gidwani; Thomas Jefferson High School for Science and Technology; Fairfax County Region
- Biochemistry: Junhyun Chong; Thomas Jefferson High School for Science and Technology, Fairfax County Region
- Chemistry: Madison Nichols and John Richardson; Massanutten Regional Governor's School, Shenandoah Valley Region
- Energy: Chemical and Physical: Khoi Nguyen, Ghedion Beyen and Sulav Regmi, Osbourn Park High School, Prince William-Manassas Region
- Engineering Mechanics: Alexandros Pfoser and Yash Amin, WT Woodson High School, Fairfax County Region
- Microbiology: Sanika Karandikar; Thomas Jefferson High School for Science and Technology, Fairfax County Region
- Microbiology: Saijai Supanklang, Miamar Burgos-Rosario and Sarah Syed; Hayfield Secondary School, Fairfax County Region
- Plant Sciences: Ryan Mollin; Roanoke Valley Governor's School/Franklin County High School, Western Virginia Region

The Yale Science and Engineering Award is presented to an 11th grade student who presents the most outstanding project in the areas of computer science, engineering, physics, or chemistry.

- Neeyanth Kopparapu; Thomas Jefferson High School for Science and Technology, Fairfax County Region