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State Science Fair Winners Announced

LEXINGTON, Va., April 7, 2017 – More than 250 high school students from across the Commonwealth took part in the 32nd annual Virginia State Science and Engineering Fair held March 25 at Virginia Military Institute. Photographs of the event are available here: <https://flic.kr/s/aHskX4XDAT>.

The Governor’s Award and grand prize went to Yashasvi Bolisetty, Nithin Dass, Srinidhi Krishnamurthy from Thomas Jefferson High School for Science and Technology in Alexandria for their project in the engineering: electrical and mechanical category, “Using a RBF kernel SVM, DWT, and PID on an EEG Controlled Exoskeleton.” Their project was also the first place winner for the category Engineering: Electrical and Mechanical.

The second grand prize went to Neeyanth Kopparapu, Justin Zhang and Kavya Kopparapu from Thomas Jefferson High School for Science and Technology in Alexandria for their project in medical and health sciences, “Mobile Diagnosis of Diabetic Retinopathy Using Deep Learning.” Their project was also the first place winner for the category Medical and Health.

The third grand prize went to Marissa Sumathipala from Broad Run High School in Ashburn for her project in cellular and molecular biology, “A Novel Systemic Approach to Cardiometabolic Dysfunction with Dual Therapeutics.” Her project also won first place for the category Cellular and Molecular Biology.

The grand prize runner-up went to Sindhu Ranga from the Academy of Science in Sterling for her project in microbiology, “Interrupting Bacterial Conversations: Increasing Microbial Fuel Cell Conductivity by Inhibiting Quorum Sensing in *S. oneidensis*.” Her project also won first place for the category Microbiology.

These projects are qualified for entry in the Intel International Science and Engineering Fair, to be held Sunday, May 14 to Friday, May 19 in Los Angeles, California.

First- through third-place category winners, honorable mentions and special award winners are as follows:

Alexandria

Cellular and Molecular Biology, honorable mention; Virginia Dental Association, Melbon Prize – Shruti Anant, “Identification of an Inhibitor of the T-cell p38 Alternative Pathway,” Thomas Jefferson High School for Science and Technology

Computer Science, honorable mention; Leidos Award in Computational Science, second – Katherine Du and Sujay Ratna, “Classifying and Predicting Antimicrobial Peptides via Machine Learning,” Thomas Jefferson High School for Science and Technology

Energy and Transportation, second - Varshini Babu and Clare Heinbaugh, “Light Wavelength Impacts Voltage Output of Dye-Sensitized Solar Cells,” Thomas Jefferson High School for Science and Technology

Engineering: Electrical and Mechanical, first; Governor's Award, grand prize – Yashasvi Bolisetty, Nithin Dass and Srinidhi Krishnamurthy, "Using a RBF kernel SVM, DWT, and PID on an EEG Controlled Exoskeleton," Thomas Jefferson High School for Science and Technology.

Environmental Management, second; NASA Earth Systems Science, winner; Virginia Section of the America Water Works Association, First Place - Victoria Graf, "Statistical Evaluation of Riparian Land Use on Virginia Water Quality," Thomas Jefferson High School for Science and Technology

Environmental Management, honorable mention; Stockholm Jr. Water Prize, winner – Mark Putman, "The Ideal Filter Medium for a Bio-retention Cell to Treat Pollution," Thomas Jefferson High School for Science and Technology

Leidos Award in Computational Science, honorable mention; Virginia Dental Association, honorable mention – Emily He and Lydia You, "Implantable Micro Bubble Pump for Drug Delivery and Biomedical Uses," Thomas Jefferson High School for Science and Technology

Medical and Health Sciences, third – Kelly Cho and Harriet Khang, "All-In-One Biosensor for the 2-min. Analyses of Coagulation Factors," Thomas Jefferson High School for Science and Technology

Medical and Health, first; Leidos Award in Computational Science, first place; Virginia Dental Association, honorable mention; Governor's Award, second grand prize – Kavya Kopparapu, Neeyanth Kopparapu and Justin Zhang, "Mobile Diagnosis of Diabetic Retinopathy Using Deep Learning," Thomas Jefferson High School for Science and Technology.

Physics and Astronomy, second – Ana Humphrey, "The Mathematical Identification of Exoplanet Candidates through N-body Simulations," T. C. Williams High School

Physics and Astronomy, honorable mention – Joshua McCoy, "The Effect of Pressure Particle Size & Density on Collection of Astrodiol Regolith," Edison High School

Physics and Astronomy, honorable mention – Rohan Venkat, "Could Life Have Existed on Earth Without Jupiter?" Thomas Jefferson High School for Science and Technology

Ricoh Sustainable Development Award, winner – David Liu "Blood Spatter Analysis," Thomas Jefferson High School for Science and Technology

Society for In-Vitro Biology, winner – Pallavi Avasarala "Lethal Effect of TDP-43 & FUS Aggregates on Aneuploid vs Euploid Cells," Thomas Jefferson High School for Science and Technology

Virginia Section of the American Water Works Association - Certificate of Merit – Brady Alexander "The Effect of Water Purification Methods on Coliform Bacteria Presence," Mount Vernon High School

ARLINGTON

Animal Sciences, second – Fiona Harris, "Tempural, Seasonal, and Lunar Influences on the Singing Patterns of Regional Ensifera Species," H-B Woodlawn Secondary Program

Behavioral and Social Sciences, second – Jacob Hall, "The Effect of Highway Font Type on Readability of Text Under Blurred Conditions," H-B Woodlawn Secondary Program

Mathematical Sciences, honorable mention – David Day, "Computing the Algorithmic 3D Optical Properties of Water and Wave Reflections in a Flood Effect Rendered on an Image," Yorktown High School

Stockholm Jr. Water Prize, winner – Chloe Fugle “The Effect of Iron (III) Oxide on the Amount of Phosphate in Water,” H-B Woodlawn Secondary Program

ASHBURN

Cellular and Molecular Biology, first; Mark Licata Award for Biotechnology, first; Governor’s Award, third grand prize – Marissa Sumathipala, “A Novel Systemic Approach to Cardiometabolic Dysfunction with Dual Therapeutics,” Broad Run High School.

Environmental Sciences, second – Sruthi Gopinathan and Pratishtha Panigrahi, “Anion exchange column method used to concentrate and purify eDNA for the identification of organism,” Rock Ridge High School

Mark Licata Award for Biotechnology, second – Tanvi Vipra, “Measuring the Effect of Amyloid-Beta Plaques on Arthropods’ Memory and Behavior in Relation to Alzheimer’s Disease,” Briar Woods High School

Leidos Awards in Applied Science and Engineering, third; U.S. Navy/Marine Corps, winner – Ashley Harris, “Black Box Retrieval: Using an Aircraft Recovery Marker System,” Patrick Henry High School

BLACKSBURG

Engineering: Materials and Bioengineering, first; ASM Material Education Foundation, winner; U.S. Navy/Marine Corps, winner – Kaelum Hasler, “Post Consumer PET as Stock for Additive Manufacturing,” Blacksburg High School

BURKE

Leidos Awards in Applied Science and Engineering, honorable mention – Zawad Islam “Augmentation of the Human Body Using a Powered Exoskeleton,” Lake Braddock Secondary School

CHANTILLY

Animal Sciences, honorable mention; American Psychological Association, winner – Nina Ferenc, “The Effect of Voltage-Changing Drugs on Regenerative Repair,” Westfield High School

Behavioral and Social Sciences, honorable mention – Madeleine LeBeau, “The Effect of Ratio of Font Size to Line Height on Memory Retention,” Chantilly High School

Leidos Award in Applied Science and Engineering, honorable mention – Krishna Kalathur and Nandish Gupta, “The Effect Of Airfoil Type On Vortices Propagation,” Chantilly High School

Virginia Dental Association, honorable mention – Dayana Jeizan, “The Effect Of Enzyme Inhibitors On High Blood Sugars In Diabetics,” Westfield High School

CHARLOTTESVILLE

Biochemistry, third – Zakary Robbins, “The Effect of Histone Modification on the Efficiency of the Chemotherapeutic Drug Cisplatin,” Albemarle High School

Energy and Transportation, honorable mention – Alyssa Jordan, “The Effect of Blade Shape on the Noise Production of Wind Turbines,” Albemarle High School

Mark Licata Award for Biotechnology, third; Virginia Dental Association, honorable mention – Mriganka Mandal, “Necrosis of Lung Adenocarcinoma by Targeting a Gamete-Specific Protein,” Albemarle High School

Mathematical Sciences, third; Mu Alpha Theta, winner – Elizabeth Kromkowski, “Are Circular Dependent Grids of Random Variables Possible? And Can They Inform Sample Point Location Selection?,” Charlottesville High School

CROZET

Earth and Planetary Science, second - Abigail Boitnott, Peter Dister and Michael LaBelle, “Surface Tension: The Underrated Phenomenon,” Western Albemarle High School

Medical and Health Sciences, second - Margaret Richey, “The Morris Orthotic--the Smart Orthotic for Diabetic Patients,” Western Albemarle High School

FAIRFAX

Biochemistry, honorable mention – Lily Li, “Inhibitor Targeting Tubulin Depolymerization and Histone Deacetylase 6,” Fairfax High School

Engineering: Electrical and Mechanical, honorable mention; Leidos Award in Computational Science, third – Nandin Padheriya and Neil Sanghavi, “Using Predictive Algorithms and Sensors to Prevent Neurological Damage,” Fairfax High School

Physics and Astronomy, honorable mention – Grace Cooper, “The Effect of Pressure Particle Size & Density on Collection of Astrodiol Regolith,” Wilbert Tucker Woodson High School

FALLS CHURCH

Behavioral and Social Sciences, first; ASU Walton Sustainability Award, winner - Mikayla Huffman, “Systematic Racism's Health Effects,” George C. Marshall High School

Energy and Transportation, third - Shreya Jain and Tulsi Mehta “The Effect of Mass (kg) and Frequency (st/min) on Energy Harvested,” George C. Marshall High School

Environmental Management, third; Stockholm Jr. Water Prize, winner – Rose Rasty, “Optimizing Oil Spill Remediation Using Ferrofluid and Algae,” George C. Marshall High School

Environmental Sciences, honorable mention – Quinn Lipetz, “Oysters Removing Nitrates from Water,” George C. Marshall High School

FRONT ROYAL

Association for Women Geoscientists, winner – Michaela Costanzo and Monica Costanzo, “Sea Sickness: Repercussions of Ocean Acidification On Marine Invertebrates,” Chelsea Academy

GLEN ALLEN

Leidos Awards in Computational Science, honorable mention - Kevin Rao, “Predicting Lung Cancer Survival And Treatment Using Machine Learning,” Mills E. Godwin High School

HAMPTON

U.S. Navy/Marine Corps, winner – Joshua Glaab, “Prototyping of 5 VTOL Aircraft: Analysis of Complexity, Controllability, Endurance & Payload Capacity,” New Horizon's Governor's School for Science and Technology

HENRICO

Environmental Management, first – Michael Pang, “Removal of Radioactive Strontium from Contaminated Water Using Novel Cost-Effective Biosorbents,” Mills E. Godwin High School

Mathematical Sciences, second – Prachi Sadekar, “The Effect of Implied Volatility on Return from the S&P 500,” Mills E. Godwin High School

Physics and Astronomy, honorable mention – Andion Dizon, “The Effect of Conditioner on Tensile Strength of Bleached Hair,” Mills E. Godwin High School

Plant Sciences, honorable mention – Amanda He, “The Effect of Ibuprofen and Penicillin G on the Germination Rate of *Lactuca sativa*,” Mills E. Godwin High School

Virginia Section of the American Water Works Association, third – Sabrina Ye, “The Effect of Tungsten Oxide on Disinfection of *E. Coli*,” Mills E. Godwin High School

HERNDON

Behavioral and Social Sciences, third - Rini Gupta and Shalini Shah, “Effect of Binaural Beats with Isochronic Tones on PTSD & GAD Patients,” Herndon High School

LEESBURG

Engineering: Materials and Bioengineering, second – Aditi Bawa, “Development and Testing of 45S5 Bioglass via Acid and Base Sol-Gel Polymerization and Fusing onto *Gallus gallus domesticus* Cervical Bones for Bone Grafting Treatment,” Loudoun County High School

LYNCHBURG

Animal Sciences, first – Emma Sisk, “The Effect of a Vacuum Environment on the Fecundity of *Hypsibius dujardini* of Tardigrades,” Central Virginia Governor's School

Engineering: Materials and Bioengineering, honorable mention; Leidos Award in Applied Science and Engineering, first; Virginia Dental Association, honorable mention – Hannah Steele, “The Development of an Efficient Radiation Shielding Fabric,” Central Virginia Governor's School/Liberty High School

Mathematical Sciences, first; Virginia Dental Association, honorable mention - Jackson Riffie, “Using Fractal Dimension to Differentiate Between Dysplastic and Healthy Cells,” Central Virginia Governor's School

U.S. Metric Association, winner; U.S. Navy/Marine Corps, winner – Carson Wood, “The Lasting Effect of Temperature Extremes on a Climbing Rope,” Central Virginia Governor's School

MANASSAS

Plant Sciences, first - Rosa and Sean Bouchery and Brandon Medellin, "The Effect of Air Pressure on Net Carbon Dioxide Absorption and Plant Growth," Osbourn Park High School

MCLEAN

Biochemistry, second – June Chang, "The Effect of Metal Ions on the Bridging of PNA Duplexes," McLean High School

Biochemistry, first – Brian Kim, "The Role of DNA Aptamers on the Analysis of Norovirus in a Sample," Langley High School

Medical and Health Sciences, third – Kelly Cho, Shinbe Choi and Harriet Khang, "All-In-One Biosensor for the 2-min Analyses of Coagulation Factors," McLean High School

Virginia Section of the American Water Works Association, certificate of merit – Amanda Smith, "The Effect of Salinity and Voltage on Electro-Dialysis Efficiency," Langely High School

MIDDLETOWN

Environmental Sciences, first – Savannah Long, "The Effect of Light on Fireflies," Mountain Vista Governor's School

PULASKI

Microbiology, third – Joseph Carman, "Pigs, potential transmitters? Clostridium Difficile and Pigs in Southwest Virginia," Southwest Virginia Governor's School

Yale Science and Engineering – Dawson Little, "The Effect of Pure Vegetable Oils On The Quality Of Biodiesel Fuel," Southwest Virginia Governor's School

PURCELLVILLE

Computer Science, first; Intel Excellence in Computer Science, winner - Samuel Dawson, "Pocket Neurologist: Creating a Mobile Application for the Early Detection of Symptoms Common to Parkinson's Disease," Loudoun Valley High School

RESTON

Engineering: Electrical and Mechanical, third – Michael Gamarnik, "The Effect of Vortex Generator Angle on the Downforce of an Airfoil," South Lakes High School

RICHMOND

Chemistry, honorable mention – Selik Morishetty, "Alginate Hydrogel Beads for Controlled Drug Delivery Applications," Henrico High School

ROANOKE

Animal Sciences, third; Virginia Dental Association, honorable mention – Ellen Wood, "Determining the Effect of Connexin-43 Mutations on Intercellular Communication," Roanoke Valley Governor's School for Science and Technology

Cellular and Molecular Biology, second – William Matthew Svec, “Analysis of in vitro Microvascular Models of Diabetic Retinopathy,” Roanoke Valley Governor's School for Science and Technology

Chemistry, first – Richard Qiu, “A Novel Hybrid Hydrogel - Preparation, Characterization, and Applications,” Roanoke Valley Governor's School for Science and Technology

Energy and Transportation, first – Isobel Baxter and Alexandra DeFelice, “Bioprospecting for Cold-Temperature Active Cellobiase to Optimize Biofuel Production,” Roanoke Valley Governor's School

Medical and Health Sciences, honorable mention – Kailyn Janiga, “The Effect of Acetylcholine on the Expression of MMPs in Glioma Cells,” Roanoke Valley Governor's School for Science and Technology

Plant Sciences, third – Carol Chen and Madelyn Nichols, “The Effect of Various Grass Extracts on the Formation of Haustoria by *C. pentagona*,” Roanoke Valley Governor's School for Science and Technology

SALEM

National Oceanic & Atmospheric Administration, winner – Kelsey Hager, “The Effect of Piers On Beach Erosion,” Glenvar High School

STAFFORD

Virginia Section of the American Water Works Association, certificate of merit – Felicity deToll, “Turbid Waters,” Mountain View High School

STEPHENS CITY

Cellular and Molecular Biology, third – Savannah Del Cid, “The Effect of Cold-induced Dinocysts on the Cyropreservation of *P. Fusiformis*,” Sherando High School

Virginia Section of the American Water Works Association, certificate of merit – Ainsley Rucker, “The Most Effective Technique for Removing Lead from a Water Source,” Sherando High School

STERLING

Chemistry, second – Maya Ramani and Sarah Raphael, “Mimicking the Lotus Leaf Creating Hydrophobic Cellulose-based Matls Through POSS-coating & Modification of Surface Nanoroughness,” Loudoun Academy of Science

Microbiology, first; Leidos Award in Applied Science and Engineering, second place; Virginia Dental Association, honorable mention; Governor’s Award, grand prize runner-up – Sindhu Ranga, “Interrupting Bacterial Conversations: Increasing Microbial Fuel Cell Conductivity by Inhibiting Quorum Sensing in *S. oneidensis*,” Loudoun Academy of Science.

Physics and Astronomy, first – Josef Zimmerman, “The Stability of Bahcall-Wolf Cusps of Dark Matter Orbiting Supermassive Black Hole Binary Systems,” Loudoun Academy of Science

THE PLAINS

Chemistry, third – Molly Cesanek, “Effects of Ice Type and Temperature on Figure Skating,” Wakefield School

VIENNA

Microbiology, honorable mention; Virginia Section of the American Water Works Association, second – Matthew Baharmast and Patrick Berry, “Effect of UV Light on Bacteria and Protist Levels in Drinking Water,” James Madison High School

VIRGINIA BEACH

American Meteorological Society, winner – Nicole Rychagov, “Climate Change in the Arctic: Mathematical Model and Validation,” Cape Henry Collegiate

Animal Sciences, honorable mention – David Weisenbeck, “Survey of the Reptiles and Amphibians in the Coastal Plains and Piedmont Basic Seepage Swamps at Chippokes Plantation State Park in Surry, Virginia,” Ocean Lakes High School

Computer Science, second – Evan Allen and Keano Rich, “Effectiveness of Long Short-Term Memory Neural Networks at Music Composition,” Ocean Lakes High School

U.S. Navy/Marine Corps, winner; Virginia Section of the American Water Works Association, certificate of merit – Wen Ip and Harin Ok, “Using Various Biosorbents to Filter Water with Copper (II) sulphate” Oakton High School

Virginia Dental Association, honorable mentions – Sky Zoom, “A Novel Sustainable Technique Uses Magnetism to Clean Up Oil Spills,” James Madison High School

WARRENTON

Engineering: Electrical and Mechanical, second – Heather Wotton, “The Effect of the Removal of Mass on the Calculated Efficiency of Structural Beams,” Mountain Vista Governor's School

Environmental Sciences, third; Virginia Section of the American Water Works Association, certificate of merit – Caragh Heverly, “Nitrate Variation within Rural Settings,” Mountain Vista Governor's School

Microbiology, second – Caroline Duckworth, “The Effect of Oxybenzone on the Luminosity of *Pyrocystis* fusiforms,” Mountain Vista Governor's School

Plant Sciences, second – Ellyse Sutliff, “The Effect of Sodium Chloride Concentration on *Brassica oleracea* var. *Sabellica* Growth in a Floating Hydroponic Garden,” Mountain Vista Governor's School

WINCHESTER

Computer Science, third; Leidos Young Research Award, winner; Virginia Dental Association honorable mention – Logan Apple, “iSight: A Mobile Gesture Recognition and Analysis Tool. Phase II,” Millbrook High School.

YORKTOWN

Earth and Planetary Science, first – Alyssa Grella and Kathryn Shelton, “The Effect of Moonlight and Light Pollution on the Skyglow of Suburban vs. Rural Locations,” York High School

Engineering: Materials and Bioengineering, third; Leidos Award in Applied Science and Engineering, honorable mention – Suparnamaaya Prasad, “Novel Membranes for Synthetic Lungs and Planetary Applications,” York High School

Physics and Astronomy, third – Miroslava Marinova, “Evaluation and Design of Variable-Depth Acoustic Liner Configurations,” New Horizons Governor's School for Science and Technology