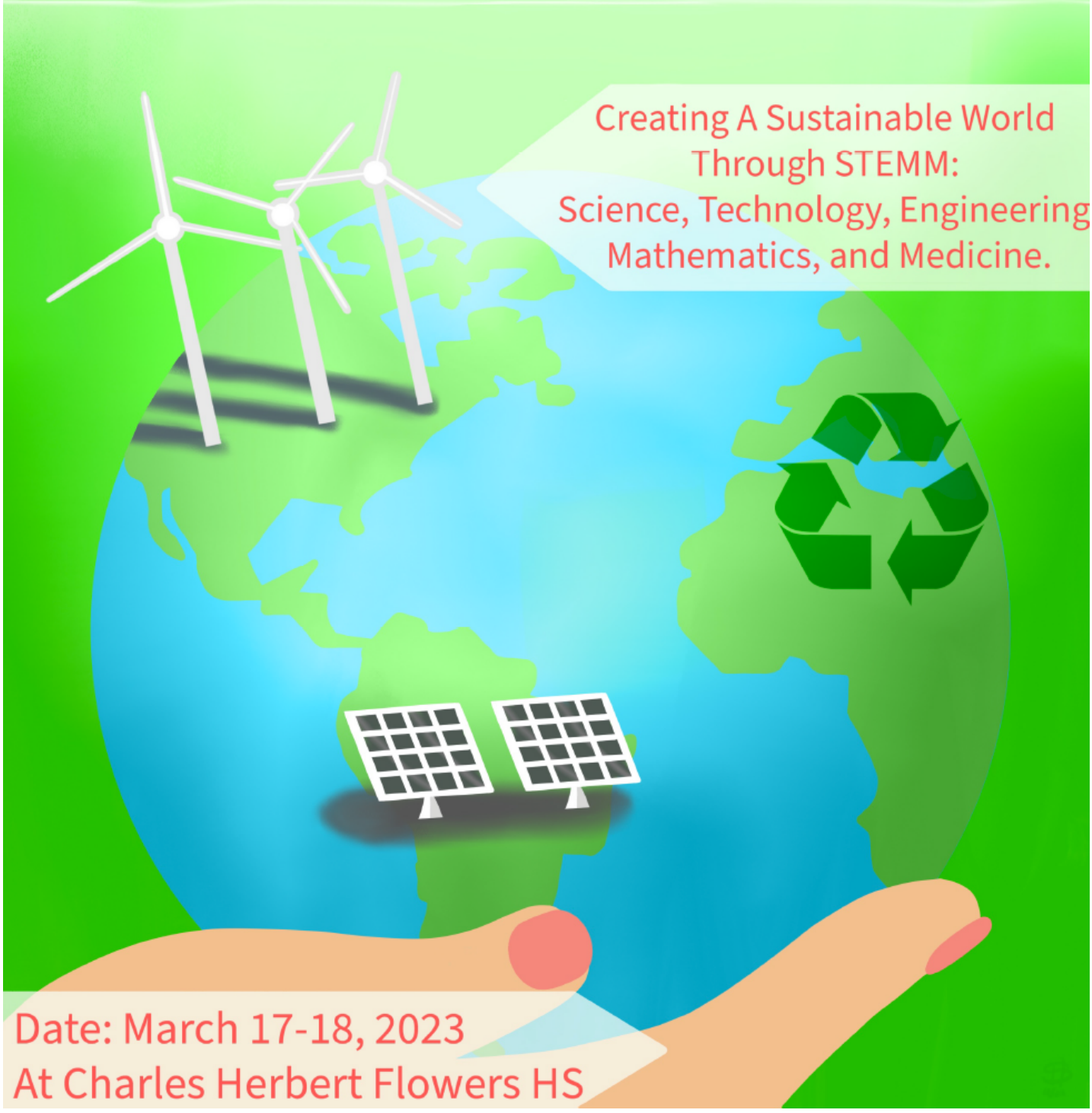
The 75th Annual Prince George's Area Science Fair



Creating A Sustainable World
Through STEMM:
Science, Technology, Engineering
Mathematics, and Medicine.

Date: March 17-18, 2023
At Charles Herbert Flowers HS

About the Cover

Welcome to the 75th Annual Prince George's Area Science Fair. Thank you for joining us as we celebrate the best and brightest students. This year's theme is **"Creating a Sustainable World *through STEMM: Science, Technology, Engineering, Mathematics, and Medicine".***

This theme reflects our commitment to developing a pipeline of innovative and futuristic discovery through scientific, technological, engineering, mathematical, and medical (STEMM) concepts and practices. The interconnections of all branches of physical, earth and planetary, chemical and biological sciences, environmental, technology, engineering, and mathematics, support innovations and discoveries that will lead to a better quality of life for humans across the world. Though the types of reasoning may seem different in the way questions are posed or examined, all of these disciplines ultimately follow a very organized and rational approach that leads to greater understanding. As we celebrate the 75th anniversary of the Prince George's Area Science Fair, we wish to emphasize that the path to discovery and innovation can be fun! Ultimately, science is not done in isolation. Innovators need to apply the knowledge, skills, and practices from multiple disciplines as they travel the road of STEM discovery.

The Cover Page Art Work

Charles Herbert Flowers High School

Student Artist: S. Alexis

Teacher: Tiffanie Anderson

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Saturday, March 18, 2023
Charles Herbert Flowers High School's
Auditorium 6:00 p.m. - 7:30 p.m.

Introduction and Greetings	**Dr. Godfrey Rangsammy** *Science Supervisor, Prince George's County Public Schools*
Category Awards	**Dr. Godfrey Rangsammy** *Science Supervisor, Prince George's County Public Schools*
	Dr. Yovonda Kolo *Supervisor of High School Science, STEM, and TechEd,* *Calvert County Public Schools*
	Mr. Jason Hayes *Science Supervisor, St. Mary's County Public Schools*
Hajime Ota Award	**Ms. Lorrie Armfield** *Science Instructional Specialist,* *Prince George's County Public Schools*
Robert L. Wistort Best Presentation Awards	**Mr. Jason Hayes** *Science Supervisor, St. Mary's County Public Schools*
Special Awards	**Dr. Godfrey Rangsammy** *Science Supervisor, Prince George's County Public Schools*
	Mr. Jason Hayes *Science Supervisor, St. Mary's County Public Schools*
Howard B. Owens Award for Best Exhibit	**Ms. Lorrie Armfield** *Science Instructional Specialist,* *Prince George's County Public Schools*
Educational Systems Federal Credit Union Awards	**Ms. Vic Samuels** *Vice President, Community Relations Educational Systems FCU*
Scholarships	**Dr. Godfrey Rangsammy** *Science Supervisor, Prince George's County Public Schools*
	Mr. Jason Hayes *Science Supervisor, St. Mary's County Public Schools*
Grand Awards	**Dr. Godfrey Rangsammy** *Science Supervisor, Prince George's County Public Schools*
Closing Remarks	**Dr. Godfrey Rangsammy** *Science Supervisor, Prince George's County Public Schools*

Categories of Competition

100 Animal Sciences: This category includes all aspects of animals and animal life, animal life cycles, and animal interactions with one another or with their environment. Examples of investigations included in this category would involve the study of the structure, physiology, development, and classification of animals, animal ecology, animal husbandry, entomology, ichthyology, ornithology, and herpetology, as well as the study of animals at the cellular and molecular level, which would include cytology, histology, and cellular physiology.

200 Behavioral and Social Sciences: The science or study of the thought processes and behavior of humans and other animals in their interactions with the environment studied through observational and experimental methods.

200 Biochemistry: The study of the chemical basis of processes occurring in living organisms, including the processes by which these substances enter into, or are formed in, the organisms and react with each other and the environment.

400 Biomedical and Health Sciences: This category focuses on studies specifically designed to address issues of human health and disease. It includes studies on the diagnosis, treatment, prevention or epidemiology of disease and other damage to the human body or mental systems. Includes studies of normal functioning and may investigate internal as well as external factors such as feedback mechanisms, stress or environmental impact on human health and disease.

500 Biomedical Engineering: Projects that involve the application of engineering principles and design concepts to medicine and biology for healthcare purposes including diagnosis, monitoring and therapy. Prominent biomedical engineering applications include the development of biocompatible prostheses, various diagnostic and therapeutic medical devices ranging from clinical equipment to micro-implants, common imaging equipment such as MRIs and EEGs, regenerative tissue growth, pharmaceutical drugs and therapeutic biologicals.

600 Cellular and Molecular Biology: This is an interdisciplinary field that studies the structure, function, intracellular pathways, and formation of cells. Studies involve understanding life and cellular processes specifically at the molecular level.

700 Chemistry: Studies exploring the science of the composition, structure, properties, and reactions of matter not involving biochemical systems.

800 Computational Biology and Bioinformatics: Studies that primarily focus on the discipline and techniques of computer science and mathematics as they relate to biological systems. This includes the development and application of data-analytical and theoretical methods, mathematical modeling, and computational simulation techniques to the study of biological, behavior, and social systems.

900 Earth and Environmental Sciences: Studies of the environment and its effect on organisms/systems, including investigations of biological processes such as growth and life span, as well as studies of Earth systems and their evolution.

1000 Embedded Systems: Studies involving electrical systems in which information is conveyed via signals and waveforms for purposes of enhancing communications, control and/or sensing.

1100 Energy: Sustainable Materials & Design: Studies processes involving the production and/or storage of energy.

1200 Engineering Technology: Statistics & Dynamics Mechanics: Studies that focus on the science and engineering that involve movement or structure. The movement will be a result of forces; the structure will be stable due to the equilibrium of forces.

1300 Environmental Engineering: Studies that engineer or develop processes and infrastructure to solve environmental problems in the supply of water, the disposal of waste, or the control of pollution.

1400 Materials Science: The study of the integration of various materials forms in systems, devices, and components that rely on their unique and specific properties. It involves their synthesis and processing in the form of nanoparticles, nanofibers, and nanolayered structures, to coatings and laminates, to bulk monolithic, single-/poly-crystalline, glassy, soft/hard solid, composite, and cellular structures. It also involves measurements of various properties and characterization of the structure across length scales, in addition to multi-scale modeling and computations for process-structure and structure-property correlations.

1500 Mathematics: The study of the measurement, properties, and relationships of quantities and sets, using numbers and symbols. The deductive study of numbers, geometry, and various abstract constructs, or structures.

1600 Microbiology: The study of microorganisms, including bacteria, viruses, fungi, prokaryotes, and simple eukaryotes as well as antimicrobial and antibiotic substances.

1700 Physics and Astronomy: Physics is the science of matter and energy and of interactions between the two. Astronomy is the study of anything in the universe beyond the Earth.

1800 Plant Sciences: Studies of plants and how they live, including structure, physiology, development, and classification. This includes plant cultivation, development, ecology, genetics and plant breeding, pathology, physiology, systematics and evolution.

1900 Robotics and Intelligent Machines: Studies in which the use of machine intelligence is paramount to reducing the reliance on human intervention.

2000 Systems Software: The study or development of software, information processes or methodologies to demonstrate, analyze, or control a process/solution.

2100 Translational Medical Sciences: Projects that aim to improve human health and longevity by translating novel discoveries in the biomedical sciences into effective activities and tools for clinical and public health use. Bi-directional in concept, projects can be those developed through basic research moving toward clinical testing (bench-to-bedside) or projects that provide feedback about the applications of new treatments and how they can be improved (beside-to-bench).

Each category description was retrieved from International Science and Engineering Fair (ISEF) categories and subcategories site at https://student.societyforscience.org/isef-categories-and-subcategories

Prince George's Area Science Fair Criteria for Judging

Judging Criteria for Scientific Projects: Individual and Team	Points Available
I. Research Question • clear and focused purpose • identifies contribution to field of study • testable using scientific methods	**10 Points**
II. Design and Methodology • well-designed plan and data collection methods • variables and controls defined, appropriate, and complete	**15 Points**
III. Execution: Data Collection, Analysis, and Interpretation • systematic data collection and analysis • reproducibility of results • appropriate application of mathematical and statistical methods • sufficient data collected to support interpretation and conclusions	**20 Points**
IV. Creativity • project demonstrates significant creativity in one or more of the above criteria	**20 Points**
V. Display Board • logical organization of material • clarity of graphics and legends • supporting documentation displayed	**10 Points**
VI. Interview • clear, concise, and thoughtful responses to questions • understanding of basic science relevant to project • understanding, interpretation and limitations of results and conclusions • degree of independence in conducting project • recognition of potential impact in science, society, and/or economics • quality of ideas for further research • for team projects, contributions to and understanding of project by all members	**25 Points**
TOTAL	**100 Points**

The PGCPS Science Office adopted the 2023 evaluation criteria for judging from the International Science and Engineering Fair for the Prince George's Area Science Fair. https://student.societyforscience.org/judging-criteria-isef

Judging Criteria for Engineering Projects: Individual and Team	Points Available
I. Research Problem • description of a practical need or problem to be solved • definition of criteria for proposed solution • explanation of constraints	**10 Points**
II. Design and Methodology • design of alternatives to answer need or problem • identification of a solution • development of a prototype/model	**15 Points**
III. Execution: Construction and Testing • prototype demonstrates intended design • prototype has been tested in multiple conditions/trials • prototype demonstrates engineering skill and completeness	**20 Points**
IV. Creativity • project demonstrates significant creativity in one or more of the above criteria	**20 Points**
V. Display Board • logical organization of material • clarity of graphics and legends • supporting documentation displayed	**10 Points**
VI. Interview • clear, concise, thoughtful responses to questions • understanding of basic science relevant to project • understanding, interpretation and limitations of results and conclusions • degree of independence in conducting project • recognition of potential impact in science, society, and/or economics • quality of ideas for further research • for team projects, contributions to and understanding of project by all members	**25 Points**
TOTAL	**100 Points**

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Science Fair Awards

To facilitate judging, the fair is divided into a Junior Division (middle school grades 6, 7, and 8) and a Senior Division (high school grades 9, 10, 11, and 12). Within each of these divisions, 22 subject areas have been established. With the exception of the Team Category, each project competes against others in its own subject area. Teams compete across all subjects. Scientists, engineers, mathematicians, or architects who are experts in the particular subject area evaluate each project. Information about the awards to be presented at the fair is given below.

Division Awards

A First Place Award may be given in each subject area in both Junior and Senior Divisions. Second and Third Place and Honorable Mention certificates may be presented to all other student exhibitors whose exhibits rate in the upper 50% of the entrants. All other exhibitors who set up their projects, maintain them properly during the fair, and remove them on time, will receive certificates of participation at the conclusion of the fair.

Grand Awards

First and Second Place Grand Award winners will be given in both Junior and Senior Divisions. In the Senior Division, the First and Second Place Grand Award winners will have an opportunity to attend the Intel International Science and Engineering Fair.

Howard B. Owens Award

These awards are given in honor of the late Dr. Howard B. Owens. Dr. Owens was the founder of the Prince George's Area Science Fair and Director for 24 years. This award will be presented for the best all-around exhibit in each division, with special emphasis on how the visual presentation communicates science.

Hajime Ota Award

This award is given in honor of the late Hajime Ota who was associated with the Prince George's Area Science Fair for over 26 years. This honor includes a plaque and cash award. It is presented for the outstanding project in Engineering in the Senior Division.

Robert L. Wistort "Best Presentation" Awards

Robert L. Wistort was one of the Washington area's finest science teachers. This award is given to the student in each subject area in each division who does the best job of explaining their exhibit to visitors at the fair. Best Presentation judging takes place Saturday evening when the fair is open to the public.

Special Awards

Independent scientific societies, industry, and government departments give Special Awards. These awards may consist of certificates, books, travel opportunities, magazine subscriptions, and cash awards. A list of the sponsors for the Special Awards is provided on the following page.

Special Awards Sponsors for the
75th Annual Prince George's Area Science Fair

Aerospace Corporation	International Science and Engineering Fair, Society for Science & the Public
ASU Walton Sustainability Solutions Initiatives	Lockheed Martin
American Industrial Hygiene Association-Potomac Chapter	MIT Club of Washington
American Institute of Aeronautics and Astronautics (AIAA)	Mu Alpha Theta
American Meteorological Society, DC Chapter	National Oceanic and Atmospheric Administration (NOAA)
American Psychological Association	National Aeronautics and Space Administration (NASA)
American Society of Mechanical Engineers	National Capital Area Chapter of the Society of Toxicology
ASM Materials Education Foundation	Office of Naval Research (ONR)-United States Navy/United States Marine Corps
Association for Women Geoscientists (AWG)	National Organization of Gay and Lesbian Scientists and Technical Professionals-Chesapeake Region
Berman Enterprises and Admiral Construction	Optical Society of America National Capitol Section & IEEE Photonics Society
Bowie Baysox	Patent and Trademark Office Society (PTOS)
Broadcom Masters-Middle School Competition	Pepco
Clean Air Partners	Prince George's Community College (PGCC)
Commissioned Officers of the U.S. Public Health Service (COA)	Ricoh Sustainable Development Award
Dayan Li	Society for In Vitro Biology
DISCOVERY Education	Society of Women Engineers, Baltimore-Washington Section (SWE-BWS)
Educational Systems Federal Credit Union	Stockholm Junior Water Prize
Fisher Scientific	U.S. Metric Association
Friends of Agricultural Research Beltsville, Inc.	United States Air Force
Friends of Jug Bay	United States Army
Geological Society for Science & the Public	Washington Statistical Society
Society of Washington (GSW)	Washington Suburban Sanitary Commission (WSSC)
Institute of Electrical and Electronic Engineers (IEEE)-Washington Section	Yale Science and Engineering Association
Intel Excellence in Computer Science, Society for Science & the Public	University of Maryland Baltimore County
Izaak Walton League of America	University of Maryland College Park

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1993- Mr. John Wolfgang, Jr.
1994- Mr. John Wolfgang, Jr.
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1998- Dr. Lloyd McAtee
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2002- Mr. Charles Hansborough
2003- Mr. Steven Lloyd
2004- Mr. Steven Lloyd
2005- Dr. Karl J. Roberts
2006- Dr. Karl J. Roberts
2007- Dr. Michael Z. Harford
2008- Dr. Michael Z. Harford
2009- Dr. Glenn Hanes
2010- Mr. Will Harr
2011- Present- Dr. Glenn Hanes

74 Years of Grand Award Winners and Schools

Senior Division (Grades 9-12)

Year	Name	Project Title	School
1949	Marshall Peters	Plastic Corrosion	Hyattsville School
1950	Frances Ann White Mary Helen Martin Dominic B. Edelen	Paper Chromatography Chromosomes and Cells Principles of a Van de Graff Static Generator and Acceleration Tube	Hyattsville School Hyattsville School Frederick Sasscer School
1951	Mary Helen Martin Jean Elizabeth Spencer Donald P. Shankweiler	Twins and Chromosome Doubling with Colchicine Toxicology of Black Widow Spider Poison Synthesis of Sulfanilamide and Sulfanilamide Derivatives	Hyattsville School Hyattsville School Hyattsville School
1952	Fred Schindler	Meteorological Factors in the Development of the European Corn Borer	Northwestern High School
1953	Don R. Boyle	Apparatus for Displaying Tube Characteristics of an Oscilloscope	Northwestern High School
1954	Robert Ambrose	Increasing Protein Content of Algae	Northwestern High School
1955	Bette Marie Coder	The Effect of Pregnancy on Mammary Cancer	Northwestern High School
1956	Robert H. Gaither Lynne Welch Taylor	Crystal Habit and Growth Is Chemotherapy the Answer to Cancer?	Northwestern High School Northwestern High School
1957	Lynne Welch Taylor Warren E. Prince	The Effect of Podophyllin on Tumor Growth Rate Spray Method for Autogenous Skin Graphs	Northwestern High School Northwestern High School
1958	George V. Waldo, Jr. Richard E. Griffith, Jr.	The Study of Water Wave Motion Responses of Certain Aquatic Plants to Environmental Changes	Bladensburg High School Northwestern High School
1959	Ernest A. Braund John W. Wood	The Resolution of the Simple Lens Telescope Soap Films	Bladensburg High School Bladensburg High School
1960	Margaret Kottke William A. Burslem, Jr.	Sugar-Boron Complexes Lethal Action of Serum on Cancer Cells	Bladensburg High School Northwestern High School
1961	Stewart R. Wood William A. Burslem, Jr.	Pascal's Triangle in Three Dimensions Combined Chemotherapy and Immunology in Cancer Control	Bladensburg High School Northwestern High School
1962	Linnea Stewart George V. Kenney	Chemical Structure and Biological Activity On Generalizing the Parabola	High Point High School Oxon Hill High School
1963	Joseph E. Maskasky Tessa Orellana	Proton Electron Accelerator Phenolices and Bacterial Rot of Bananas	DuVal High School Northwestern High School
1964	David L. Abel David R. Jefferson	Plasmodium berghei; p-aminobenzoate An Experimental Algebra	Northwestern High School High Point High School
1965	Susan D. Delaney David R. Jefferson	Ionic Crystals in an Electrostatic Field Isosceles Trigonometry	Bladensburg High School High Point High School
1966	James E. Harper, III David R. Jefferson	The Velocity of Light A New Analytic Function	Oxon Hill High School High Point High School
1967	Thomas H. McGovern John C. Whitehouse	Crowding, Cortisone and Death An Experimental Computer	Northwestern High School Oxon Hill High School
1968	William J. Dichtel, Jr. Robert D. Rappleye, II	Irrigation With Sea Water Growing Dunes Part III	High Point High School Northwestern High School
1969	Glenn W. Hanes Michael B. Ellerin	Photodissociation Processes in Triarylacetonitrilles Color of Slate How They Rate	DuVal High School High Point High School
1970	Bruce C. Marusich Frederick B. Temple, Jr.	Staph Aurous Challenge Hypobolic Pressure Squaresville in Digital Addition	Surrattsville High School Potomac High School
1971	Linda Coffman	Does Vitamin C Prevent Liver Damage?	Northwestern High School
1972	Rickey D. Chapman David R, Williams	Magneto Hydrodynamics A Thermal Analysis of Elastomers	Parkdale High School Friendly High School
1973	Fallon Maylack Stanley A. Cousins	Immunotherapy of Cancer Air Resistance in the Ultimate Car	Bowie High School Crossland High School

Year	Name	Project Title	School
1974	Ellen Kessler Paul Goodsaid	Mathematical Probability in Music Assays of Anti-Caries Compounds	Parkdale High School Oxon Hill High School
1975	Cecily Skoog Steven Cousins	Slug Antenna Reaction Dampier Effect on Outlet Performance	Bowie High School Crossland High School
1976	Joseph Andeson Frank Shih, Jr.	The Taxonomy of Atratoserus Biometrics	Bowie High School Bowie High School
1977	David A. Fuchs Jeanne L. Sears	Effects of CO-60 On C3H Mice of Mice And Men	Eleanor Roosevelt High School Friendly High School
1978	Steven A. Lloyd Michael Briggs	The Spectrochronometer Infinite and Finite Games	Eleanor Roosevelt High School High Point High School
1979	Steven A. Lloyd Charles Andraka	Liquid Phase Opto-Galvanic Effect Can Complex Classroom Casts Be Done?	Eleanor Roosevelt High School Eleanor Roosevelt High School
1980	Steven A. Lloyd Charles Andraka	Photovoltaic Reactions of Pigments Variable Displacement - A New Twist	Eleanor Roosevelt High School Eleanor Roosevelt High School
1981	Paul E. Young John F. Lunny, Jr.	Microsporidan Control of Beetles How Do We Know If a Number is Prime?	Eleanor Roosevelt High School McDonough High School
1982	Jonathan Santos Marvin Erdley	Conquering the Tip Vortices The Simplex and Tesseract	Bowie High School Lackey High School
1983	Jonathan Santos Arvind Sinha	Tip Vortex Propulsion A New Approach A Position Sensor for Robots	Bowie High School Eleanor Roosevelt High School
1984	Atul Patel Carol Lynn Thomas	Solar Energy: A Renewed Approach H20 Absorption/Torsional Strength	Bowie High School Thomas Stone High School
1985	Carol Lynn Thomas John Barnett	Biaxial Stress on Cantilever Wings Soap Film Calculus	Thomas Stone High School Eleanor Roosevelt High School
1986	Ernest G. Brown Arvind Krishnamurthy	Analysis of Insect Neuropeptide Age Factor in Predator-Prey Systems	Eleanor Roosevelt High School Eleanor Roosevelt High School
1987	Shibani Pati George Thomas	Cellular Convection and Rotation Narrow-Band Speech Coding	Eleanor Roosevelt High School Eleanor Roosevelt High School
1988	Sylvia Sid Jean Wang	Effects of Birdsfoot Trefoil Root Exudate on Stimulation of Rhizobium Loti Growth Preventing Browning of Fruit Tissues	Oxon Hill High School Eleanor Roosevelt High School
1989	Sheron Tera Buckland Jean Sandy Wang	Vitamin E's Effects on Mutagenicity Mechanism of Browning in Apple Tissue	Oxon Hill High School Eleanor Roosevelt High School
1990	Paul M. Rice Gabriel D. Cahalan	The Effect of Diazinon on Musca domestica Chaos and Order in a Dripping Faucet	Eleanor Roosevelt High School Central High School
1991	Ken S. Wang Mark Pilloff	Chemical Regulation of Plant Growth Electron Emissions from Micro-Cathodes	Eleanor Roosevelt High School Oxon Hill High School
1992	Ken S. Wang Peter P. Zapalo, III	Omega-3 Fatty Acids in Algae Mellifera Hydrocarbon Differences	Eleanor Roosevelt High School Oxon Hill High School
1993	Ken S. Wang Vladimir Mandic	Reduction of UV-B Damage on Omega-3 Fatty Acids in Algae High-Performance Computer Animation	Eleanor Roosevelt High School Oxon Hill High School
1994	Sherry Ashby Hammad S. Matin	Shrink Fit Systems The Effects of Oxygenation on Gasoline Products	Eleanor Roosevelt High School McDonough High School
1995	Joseph Lucas Sajjad Matin	New Classical Basis for Quantum Physics Design of Wetlands for Water Quality	Oxon Hill High School McDonough High School
1996	Lala Qadir Yvette K. Wood	Incineration in a Bubble Does Cardiac Fibrillation have Chaotic Tendencies?	La Plata High School Oxon Hill High School
1997	Lala Qadir Cameron Horn	Incineration in a Bubble II Real-Time 3D Rendering Engine	La Plata High School Eleanor Roosevelt High School
1998	Margot Gianetti Diane Kang	What's in a Cell? The Effect of MPP+ on PC12 Cells	Eleanor Roosevelt High School Eleanor Roosevelt High School
1999	Rachel Williams Michael Smit	Blue Crab Fecundity Development of a Genetic Algorithm	Patuxent High School Eleanor Roosevelt High School
2000	Brett Darcey Kelly Loyer	Engineering: An Accurate Simulation to be used with Rockets Assessment of a Solo Performance	Great Mills High School La Plata High School

Year	Name	Project Title	School
2001	Elisabeth Stratton Christina Dwyer	Short Range Attractions Between Male and Female Eptinotarsa decemcineata Asteroidal Occulations of Stars	Eleanor Roosevelt High School Eleanor Roosevelt High School
2002	Nicole Carbonaro Mary Brazelton	Dancer and Hurdlers Leap for Physics Odd Oscillations	Great Mills High School Bishop McNamara High School
2003	Sarah Bates Lyen Acosta	Optimization of Satellite Orbits: Through the Magnetosphere Bioluminescence: The Role of ATP in Detection of Biocontamination	Eleanor Roosevelt High School Oxon Hill High School
2004	Sara Brownlee Anthony DeGennaro	The Role of Phosphorus in Controlling Shifts & Transformations: Mandelbrot Set	Calvert High School Bishop McNamara High School
2005	Nick Brono Ramzi Muklar	Diesel Fuel from Vegetable Oil A Mathematical Expression Compiler	Leonardtown High School Eleanor Roosevelt High School
2006	Aarish Shrestha Julie Walker	Environmental Study of Early Eukaryotes The Dust Devils Did It - Wind Erosion in Gusev Crater Mars	Eleanor Roosevelt High School Leonardtown High School
2007	Dayan Li Darnell Primus	Tumor Marker Expr. In TSP1-NO Interaction Basic Poly VDW	Eleanor Roosevelt High School Eleanor Roosevelt High School
2008	Luke Gridley Julie Walker	Boats, What a Drag? What A MES Mars Environment Simulator II	Huntingtown High School Leonardtown High School
2009	Julie Walker Falin Patel	What A MES Mars Environment Simulator III The Effects of Mutated Hsc20	Leonardtown High School Eleanor Roosevelt High School
2010	Demi McCoy Mark Ragland	Batter Up Simulating Ocean Water for Video Laser Communication	Dr. Henry A. Wise Jr. High School St. Mary's Ryken High School
2011	Christopher Chornay Kelles Gordge	Making Waves: Water Depth Vs. Wave Speed Critical Point of View	Eleanor Roosevelt High School Great Mills High School
2012	Sara Moore Kelles Gordge Terrence Price Connor Alsheimer	Get Your Head In the Game Again Direction Detection What Stinks? Lichtenberg Lightning	Great Mills High School Great Mills High School Eleanor Roosevelt High School Great Mills High School
2013	Aaron Solomon Neelanjan Lakshman Mina Fahmi	Effect of Polymer Coated Fertilizers c-IAP2 E3 Activity On Regulatory T-cells iControl	Eleanor Roosevelt High School Leonardtown High School Great Mills High School
2014	Michael Lopez Mina Fahmi Moises Diaz and Judah Brooks (Team) Sinmisola Tinubu	Rain Power Development of a Robot Flexible Shape Changing Wings Composting Halyomorpha Halys	St. Mary's Ryken High School Great Mills High School From The Heart Christian School (9-12) Eleanor Roosevelt High School
2015	Sarah Asfari and Yousuf Asfari (Team)	Constructing a Carcinogen Indicator Application Based on Statistical Analysis of Statewide Cancer Incidences in Relationship with Graphical Consumer Data	Al-Huda School
2016	David Gardner	Motion Planning for Surgical Needs	Eleanor Roosevelt High School
2017	Duy Nguyen and Hunter Whaples (Team)	Effect of Contaminants on Acid Gas Pyrolysis	Eleanor Roosevelt High School
2018	Teresa Ozga	CD47 Morpholino Antisense	Eleanor Roosevelt High School
2019	Mitchell Smith	Bilman-Trogdon IST for the Toda Lattice	Eleanor Roosevelt High School
2020	Melissa Jones		Eleanor Roosevelt High School
2021	Yeabkal Abeje		Eleanor Roosevelt High School
2022	Morelle Meegane Konchou		Eleanor Roosevelt High School

Grand Award Winners and Schools

Junior Division (Grades 6-8)

Year	Name	Project Title	School
1955	Jean Marsh	Learning About Sweet Potatoes	Hyattsville Middle School
1974	David Salzman Lenka Babuska	Flip Flops Toxicity of Ethanol and Nembutal	John Hanson School Greenbelt School
1975	Glen Taylor Kurt J. Mayrand	Wonders of the Universe Dissociative Constant Determination	Glenridge School Benjamin Tasker School
1976	Michael Lee Karen Vossler	Mission to Mars The Compost Pile and Photosynthesis	Buck Lodge School Belair School
1977	Kimberly Y. Russell James R. Cevenini	The Credibility Gap of Disinfectants The Universe and Its Components	Mount Calvary School St. John's School
1978	Melanie A. May Vi Babuka	Pollution in Henson Creek? Computers and War Games	Eleanor Roosevelt School Eleanor Roosevelt School
1979	Courtney A. Miller Nicholas S. Andraka	Knowledge Transfer in Dugesia Can Robotics Imitate Human Parts	Eleanor Roosevelt School Dwight D. Eisenhower School
1980	Kenneth S. Weiss Daniel John Di Lorenzo	Crowding in Biological Communities Computer / Manual Controlled Robot	Thomas G. Pullen School St. Columba School
1981	Caglan Aras Mark Erdly	Hydrogen Production By Solar Energy Effecting Load Transferring	Eleanor Roosevelt School Lackey School
1982	Michael C. Corrado Gretchen Ginter	Factor Lattices Effects of Atrazine on Marine Algae	Holy Family School Eleanor Roosevelt School
2003	Anthony DeGennaro Sarah Dickerson	Little Fermat Theorem with a Bog Twist Polluted Pachysandra Fight Back!	St. Phillip the Apostle School Hyattsville Middle School
2004	Morgan Miller Joshua Queen	Tell Tale Footprints Up, Up, and Away	Father Andrew White School St. Mary's School
2005	Julie Walker Keith Hinton	It's a Small School After All Berry! Berry! Good	Father Andrew White School Robert Goddard French Immersion School
2006	Patrick Husson Claire Flintoff	Can a Picture Hide a Thousand Words? The Good, the Bad, and the Oily	St. Columbia School Robert Goddard French Immersion School
2007	Andrew Degennaro Christian Cardwell	Needles, Boards and PI, OH MY! Pressure vs. Distance	St. Philip the Apostle School St. Columbia School
2008	Kelles Gorge Calvin Davies	Global Meltdown! I Can See Clearly Now	Esperaza Middle School Mill Creek Middle School
2009	Sara Moore	Feathered Flight Simulator	Spring Ridge Middle School
2010	Nirvana Lutchman	How Does Age Affect Court Fear?	Dwight D. Eisenhower Middle School
2011	Alsheimer Quinn	Can You Hear Me Now?	Spring Ridge Middle School
2012	Anna Stevenson Rupali Shah	Which Nozzle Should You Pick? Braking News	Spring Ridge Middle School Spring Ridge Middle School
2013	Carlea Williams-Locks	Diabetes EEG	Chesapeake Math and IT Charter
2014	Jim Toledo Olivia Sowa	Pseudo-Random Number Generator Fright Light	Spring Ridge Middle School Spring Ridge Middle School
2015	James Dawson	Here Comes the Sun (spots)- The effect of Sunspots on the Earth's Magnetic Field	Hyattsville Middle School
2016	Megan Lim	What's a Gazillion?	Accokeek Academy
2017	Liam McCarthy	Is Something Bugging You?	Spring Ridge Middle School
2018	Tom Wilson	Vacation Irrigation	Spring Ridge Middle School
2019	Camille Nelson	Launch satellites with electromagnets?	Spring Ridge Middle School
2020			
2021	Sydni Burse		From The Heart Christian School (6-8)
2022			

Team Finalists

Year	Name	Project Title	School
1995	Christina Higdon and Nicholas Hileman	Can Bioremediation Remove Chemicals?"	West Lake High School
1996	Olivia Campbell and Mihele Martin	Concrete Made With Recycled Materials	Northern High School
1997	Jason Garman, Branden Hall, and Brian Robak	Design and Development of Algorithms	Eleanor Roosevelt High School
1998	Jeffrey Abshire and Jonathan Nagy	3D Rendering Engine with Kinematics	Eleanor Roosevelt High School
1999	Lauren Barrett and Sarah Secules	Reverse Engineering Electronic Cells	Eleanor Roosevelt High School
2000	Catherine Dozier, Katrina Robinson, and Melynda Scriver	Probability: Numbers Matter	Gwynn Park High School
2001	Jonathan Curtis and William Martin	Civil War Wounds That Glowed	Bowie High School
2002	Christina Weaver and Jaquay Powell	ABC 123 PCB	Oxon Hill High School
2003	Jeffrey Dronenburg II and Matthew Martz	Mad Science: Electrokinetic Propulsion	Great Mills High School
2004	Eletha Flores and Justin Racadio	Death by Gas Attack	Charles H. Flowers High School
2005	Tristan Gilford and Tara McCarron	Attenuation of Microwave Powder Filters	Eleanor Roosevelt High School
2006	Eletha Flores and Jay Carson	Self-Healing Struts	Charles H. Flowers High School
2007	Amanda Davenport and Christine Danielson	Temperature & Sand Fly	Eleanor Roosevelt High School
2008	Emily Brinker and Rachael Kerry	An Analysis of Rewards vs. Punishment Systems	Northern High School
2011	Naqvi Kulsoom and Zurana Taluckder	No More Crying Over Onions	Eleanor Roosevelt High School
2013	Arnesen Gunner, Kubala Vince, and Joey Watts	Testing Texas Hold'em Personalities	Great Mills High School
2014	Moises Diaz and Judah Brooks	Flexible Shape Changing Wings	From The Heart Christian School (9-12)
2016	Sarah Asfari and Yousuf Asfari	Constructing a Carcinogen Indicator Application Based on Statistical Analysis of Statewide Cancer Incidences in Relationship with Graphical Consumer Data	Al-Huda School
2017	Duy Nguyen and Hunter Whaples	Effect of Contaminants on Acid Gas Pyrolysis	Eleanor Roosevelt High School
2018	John Podsednik, Kyra Pratley, and William Vorhees	Prescripted Code	Dr. James A. Forrest Career And Technology Center
	Nathan Hayes, Jim Kong, and William Longsworth	Lago: The Study of Neural Networks to Play Othello	Northern High School

Prince George's Area Science Fair Winners
Intel ISEF 2019 (Phoenix, Arizona)

Three students representing the Prince George's Area Science Fair: Mitchell Smith and Carla Rose (Prince George's County Public Schools), and Kobi Robinson (From the Heart Christian School) traveled to Phoenix, Arizona to compete at the 2019 Intel International Science and Engineering Fair (INTEL ISEF). The fair was held May 12-17, 2019.

Students engaged in discussions with innovative scientists on the cutting edge of their fields, while competing with approximately 1,800 other high school students representing over 80 countries, regions, or territories. Between attending symposia, judging, and presenting their projects to public, our finalists participated in a pin exchange where students gave and received pins from the different delegations. All finalists had opportunities to attend entrepreneurship panels, events at the ISEF Commons, and to attend an Arizona Diamondback's Baseball game at Chase Field. The week concluded with a large ceremony recognizing the winners of special awards and top finishers in the competition.

Contributions

Scholarships

Prince George's Community College (PGCC) – one scholarship for two years of full-time study, which includes tuition, fees, and books.

University of Maryland, Baltimore Campus (UMBC) – two scholarships valuing $5,000/year for four years.

Regeneron International Science and Engineering Fair (ISEF) Trip

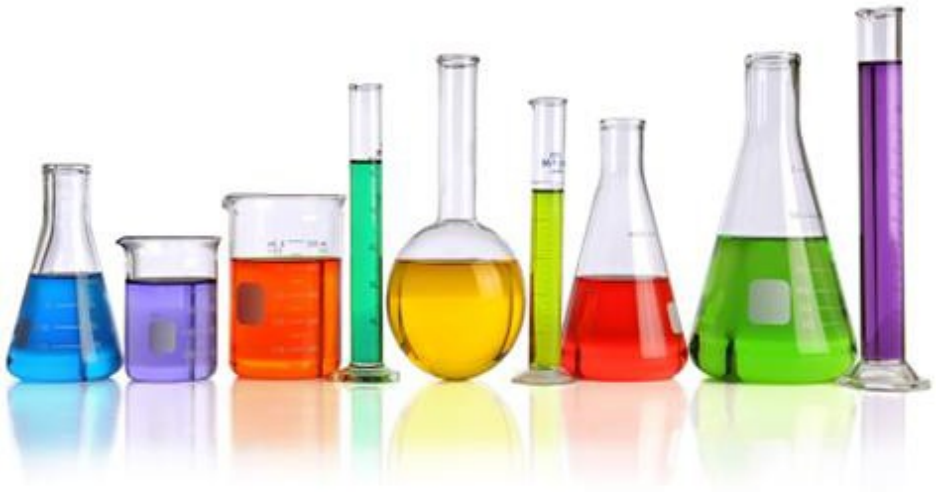
The First and Second Place Grand Award Winners in the Senior Division and the top Team may have an opportunity to travel to the Regeneron ISEF Fair held in Anaheim, California. The International Science and Engineering Fair will take place from May 10-15, 2020.

Special Thanks

Substantial support to the Prince George's Area Science Fair has been made by: Prince George's County Public Schools, Prince George's Science Fair Association, Calvert County Public Schools, and St. Mary's County Public Schools and Science Fair Board.

Prince George's Area Science Fair Association Executive Members:

President, Glenn Haynes
President-Elect, James W. Harr
Recording Secretary, Peggy Webster
Treasurer, John C. Webster



Special Acknowledgements

Category and Special Awards Judges

On behalf of the charter, parochial, private, and public schools of Calvert, Prince George's, and St. Mary's Counties, we would like to thank each of the Category and Special Award Judges for taking part in the 75th Annual Prince George's Area Science Fair. Your expertise to judge the students' projects plays a valuable and intricate part in making the Science Fair a success. We thank you for your time and commitment on this day, Saturday, March 18, 2023.

2023 Prince George's Area Science Fair Steering Committee

The PGCPS Science Office would like to thank each of you for your time, effort, dedication, and hard work to help this fair be a success. Your contribution behind the scenes is sincerely appreciated! Again, WE THANK YOU!!!!

Amal Daham, Charles H. Flowers HS	

Special Acknowledgements

Special acknowledgments to the following:

Mr. Eric S. Snyder (Owner), Mr. Raymond Green (Marketing Director), and Chick-fil-A for sponsoring breakfast for our judges and volunteers;

Educational Systems Federal Credit Union for sponsoring lunch for our judges and volunteers;

Mr. Jonathan Johnson, Mr. Dallas Pinkney, and their staff from Prince George's County Public Schools Supply Services - Warehouse for all the special work they do in delivering and providing material support for the PGASF;

Dr. Gorman Brown, Principal of Charles Herbert Flowers High School for supporting the PGASF;

Mr. Earl Todd and his staff from Charles Herbert Flowers High School for making all the necessary accommodations needed to host the fair;

Dr. Felicia Martin Latief, PGCPS STEM Supervisor, for her support and insight with Logistics for our PGASF;

The Prince George's County Public Schools' Office of Printing Services for their continued support in the printing of this Science Fair Booklet;

The Prince George's County Public Schools' Science Office Staff, our PGASF Committee Chairs, and all the volunteers for their support, dedication, and patience in organizing this event and helping this event to be a success;

All the Teachers, Science Department Chairs, STEM Fair Coordinators, and Administrators involved with conducting local school STEM fairs—we thank you; and

All the Parents and Guardians for supporting their children in the academic area of STEM and participation in this event!

Prince George's County Public School's Science Office

Godfrey Rangasammy, Ed.D., Science Supervisor, PGASF Director
Lorrie Ann Armfield, Science Instructional Specialist, PGASF Coordinator
Traci Walkup, Science Instructional Specialist
Tanisha Johnson, Science Instructional Coach
Manda Jackson, Science Instructional Coach
Jillina Burnett, Secretary

Sponsors

Calvert County Public Schools,
Prince George's County Public Schools, and
St. Mary's County Public Schools

In cooperation with the
Prince George's Area Science Fair Association
and the St. Mary's County Science Fair Board

Participation in this Science Fair is open to students of charter, public, private, and parochial schools of Calvert, Prince George's, and St. Mary's Counties in Maryland.

Special Thanks To:
Principal Gorman Brown and staff from
Charles Herbert Flowers High School
for hosting the 75th Annual Prince George's Area Science Fair.

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