

AIAA NCS Science Fair Results 2006

Charles County (MD) Science Fair

Mike Poliszuk (Dept of Navy), Ron Muller (QSS), and Don Brownlee (Aerojet) represented AIAA at the Charles County Science Fair at North Point High School, Waldorf, MD on Saturday March 11. The judges were impressed with the number and caliber of exhibits. The selected winners were:

Grand Prize was awarded to Jordan Prince, a La Plata High School senior. His physics exhibit demonstrated how the Earth's mass could be measured with 90% accuracy using a device constructed from common household items. He noted that this is the first ever working model of its type demonstrated at a youth science fair.

1st Prize Senior went to Josh Queen, a McDonough High School sophomore. His physics exhibit evaluated the effect of various wing dihedral on aircraft lift, using a working wind tunnel that he built to perform his analyses.

1st Prize Junior was won by Cayley Dymond, a Matthew Henson 6th grader. Cayley evaluated the most efficient way to produce heat from solar energy by determining whether concave versus convex parabolic shapes should be used. She determined the most efficient shape to concentrate the solar energy and demonstrated its effectiveness by cooking hot dogs. Her interest is in finding a cheap heat source for cooking food in under-developed countries.

Northern Virginia Science and Engineering Fair

The Northern Virginia Science and Engineering Fair (covering Arlington, Falls Church and Alexandria) was held at Wakefield High School, Arlington, VA on Saturday, March 11. Judges were Larry Epley (Lockheed Martin), Emily Stoneham (Dept of Navy), and Dallas Bienhoff (Boeing).

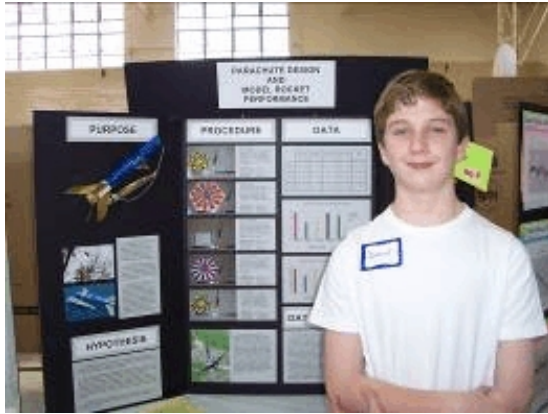


The Grand Prize was awarded to 10th grader Sasha Denisin from T.C. Williams for her project, "The Effect of Injection of Water on the Thrust of a Turbojet Engine." Sasha theorized from observations made while flying commercial airliners, that rain would increase the thrust of the engines due to the increase of air mass. She used a vacuum cleaner engine to mock up a station where she could increase the water injected into the engine to test the theory.

The First Prize Winner of the Senior Division was Bishop Ireton 12th grader, Patrick Drury, for his project, "Airfoils." Patrick theorized that shape of an airfoil (wing) would affect its lift capacity. He built a very complex wind tunnel based on actual wind tunnel designs, as well as an ingenious instrument to test loads of each airfoil at various angle of attack. He performed a very thorough test of all the airfoils, and found some very surprising results.



The First Prize Winner for the Junior Division was 7th grader Daniel Guenther from H-B Woodlawn. His project was entitled, "The Effect of Parachute Design on Model Rocket Performance." Daniel wanted to know why most rocket parachutes, like those used by NASA, had a single hole. He systematically tested a number of designs based on observation and personal theory, and wanted to find out the hang time one deployed. He identified a number of interesting phenomenon, from size of chute to placement of holes.

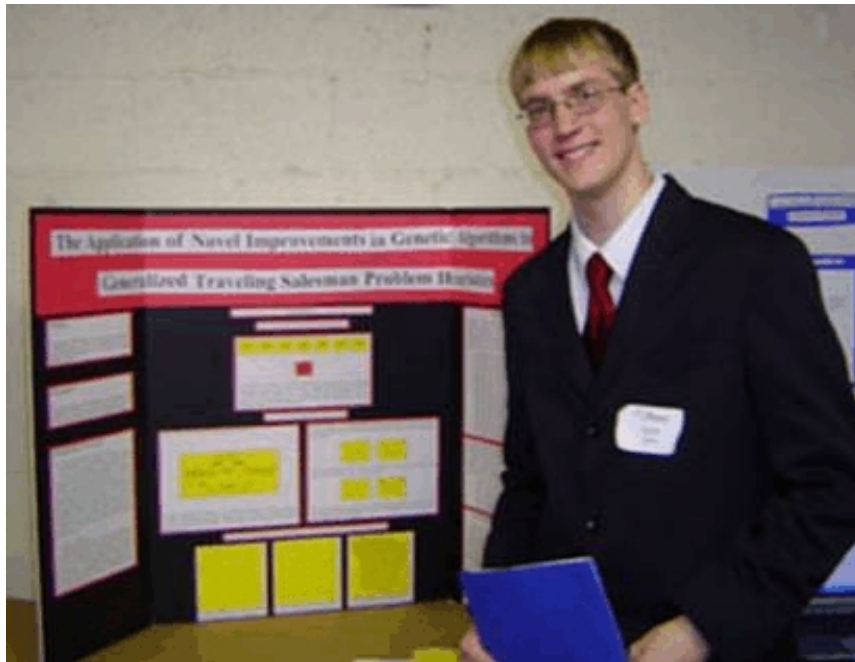


Montgomery (MD) Area Science Fair

Judges Bruce Cranford (consultant), Chandru Mirchandani (Lockheed) and Everett Watson (Lockheed) evaluated the Montgomery Area Science Fair, held at the Montgomery County Fairgrounds, Gaithersburg, MD on Saturday March 11.



Grand Prize went to Bryan Renaud for his project "Economical Solar Water Distillation System." Bryan researched and developed a small economical solar water distillation system to provide potable drinking water that can be built and used in 3rd world countries. Bryan is at Bethesda-Chevy Chase High School.



Senior 1st place was awarded to John Silberholz for "The Application of Novel Improvements in Genetic Algorithms to Generalized Traveling Salesman Problem Heuristics." John is at Montgomery Blair High School.



Junior 1st place went to Yashodhara Rao at Parkland Middle School for "Dynamics of Fluid Flow around Objects of Different Shapes." Her project investigated the fluid flow of different shapes in water.

Loudoun County (VA) Regional Engineering and Science Fair

On Thursday March 16, Dr. Michael McFarland (SAIC), Mr. John Martin (FCC), and Mr. Dean Sawyer (Booz Allen Hamilton) for bringing their areas of expertise and years of experience to the 25th Annual Loudoun County Regional Engineering and Science Fair held at Heritage High School in Leesburg, Virginia. Special thanks go to the students for their hard work and their mentors for guiding the research efforts. There was no junior high division at this fair, so Grand, First and Second Prizes were awarded.



Grand Prize was awarded to Adam Fuhrmann, a Junior from Heritage High School for his project "Rotational Transfer Dynamics of a Combined Momentum eXchange/Electro-dynamic Reboost (MXER) Space Tether System." This project investigated the transfer of momentum from a Space Tether to efficiently boost a satellite from a Low Earth Orbit to a Geostationary orbit. By using a low friction surface, the Ashburn Skating Rink, he demonstrated the capture, transfer of momentum, and release of a simulated satellite by recording the trials and extracting the parameters for further calculation.



First Prize went to Robert Minehart, a Senior from Dominion High School. Bobbie's project was called "Enhanced Maneuverability of Rocket Torpedoes Using a Porous Plat Skin Design." This was an extension of previous year's project work that investigated the ability to use and maintain a supercavitation envelope around a torpedo shaped object. This year he investigated and identified the relationship between the tip and skin ejection ratio required to execute turns through multiple turning angles.



Second Prize was awarded to James Callen, a Sophomore at Heritage High School. His project, "The Effect of Angle of Attack upon RPM's and Thrust,' investigated the effects of propeller angle-of-attack on the thrust produced and the change in RPM's of an electric motor. He used a unique test method to measure the rotation rate of the propeller.

District of Columbia Mathematics, Science and Technology Fair

The District of Columbia Mathematics, Science and Technology Fair was held at McKinley High School, Washington, DC on Saturday March 18. Judges included Mike Hirschberg (CENTRA

Technology), Pathik Shah (Univ. Maryland) and Justin McFarland (SAIC).

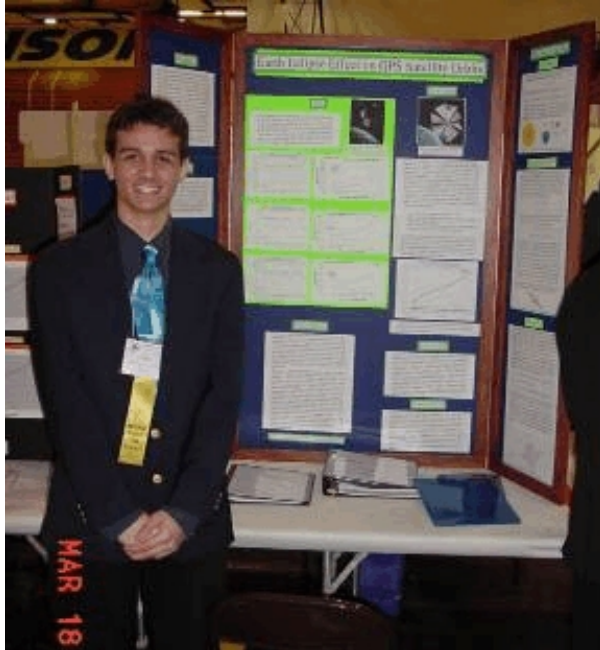
The Grand Prize was awarded to Anh Nguyen, an 11th grader at Woodrow Wilson Senior High School for his project, "Life Out in the Cold: the Orbital Journey of Asteroid 42 Isis.' Anh used a three photos of an asteroid taken by a starscope and a computer program he developed to calculate the asteroids orbital parameters.

1st Prize in the Senior Division went to Zachary May, in the 11th grade at Schools Without Walls Senior High School. His project was entitled, "Arrow Dynamics: Fletching and an Arrow's Accuracy.' Zachary built a homemade bow and conducted a series of tests on three types of arrows, each with a different fletching design.

1st Prize in the Junior Division was awarded to Benjamin Horkley, an 8th grader at Alice Deal Junior High School. Benjamin's project, "Airline Route Systems' analyzed the efficiencies of the hub-and-spoke airline routes vs point-to-point.

Fairfax County (VA) Regional Science and Engineering Fair

The Fairfax County Regional Science and Engineering Fair was held at Robinson High School, Fairfax, VA on Saturday March 18. AIAA/NCS judges were Sean Griffin (Dept of Navy), Patricia Davis (AeroAstro), and Dr Bill Seng (AeroAstro). There was no junior high category, so first and second place awards were given.



Grand Prize was given to Daniel Jachowski a 12th Grade student. His project was entitled, "Earth Eclipse Effect on GPS Satellite Orbits." Daniel modeled the contribution of the solar radiation pressure effect at the edges of the earth's shadow on a GPS satellite's orbit.

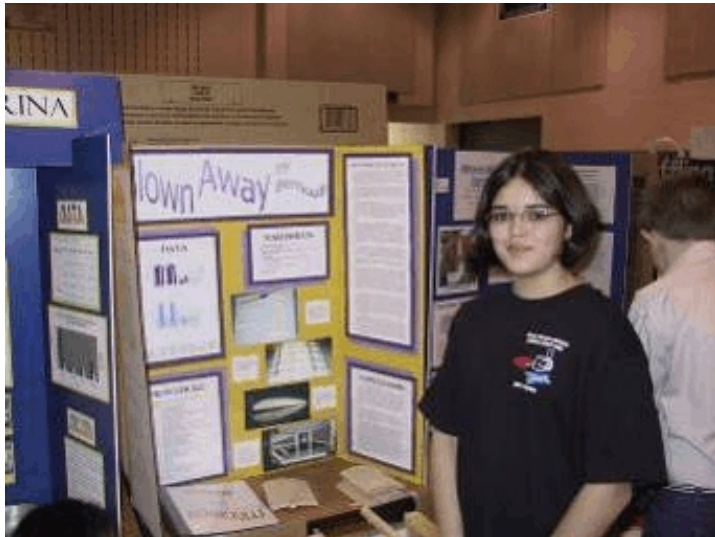
First Place went to Scott Miller, in 9th Grade, for his project, "The Effect of Fin Angle on the Altitude of a Rocket." Scott tested four different fin angles on a model rocket and measured the altitude while observing spin rate and stability.

Second Place was awarded to Matt Smith, 10th Grade for "Effects of Blades on Thrust and Power Consumption." Matt tested a variety of propellers and measured thrust and power

consumption using an innovative counterbalance approach.

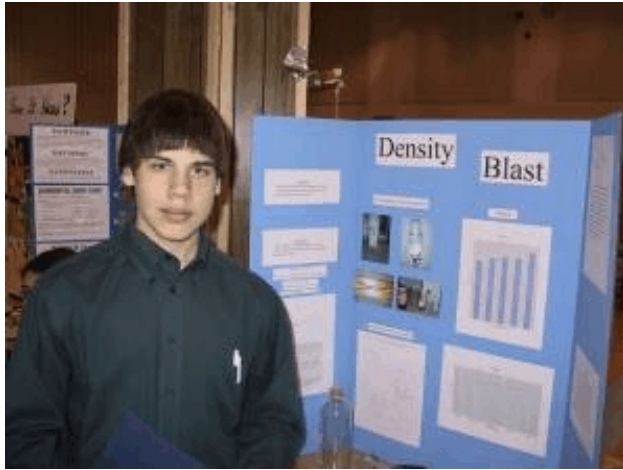
Prince William-Manassas (VA) Regional Science Fair

On Saturday March 18, Joe Marshall (BAE Systems), Steven Millard (FAA/AST), and Craig Staresinich (Northrop Grumman) judged the Prince William-Manassas Regional Science Fair, held at Grace Metz Middle School in Manassas, Va.



Grand prize was awarded to Emily Catedril of Stonewall MS for her project "Blown Away by Bernoulli." She looked at Bernoulli's effects on various wing shapes she built from sketches she

found online. She built a small wind tunnel and evaluated the amount of lift.



1st Prize in the Senior Division was awarded to Frederick Olson of Stonewall Jackson HS. For his project, "Density Blast," Fred filled a bottle with liquids of different densities and measured how much propulsion each produced under equivalent pressures. He created a low-cost strip chart to capture these high speed events and came up with a variety of engineered solutions to measure this experiment.



1st Prize in the Junior High (Middle School) division went to Kyle Syllivan of Marsteller MS. For his project, "Spinning through the Wind," Kyle built three different windmill shapes with the same area and compared wind speed using a drill to power them and then measure wind speed.

Prince George's (MD) Area Science Fair

The Prince George's Area Science Fair (including Prince George's, Calvert, and St. Mary's Counties) was held at the PG Community College in Largo, MD on Saturday April 1. The judges were Michael Collins (ASRC), Mike Koss and Randy Rausch (General Electric).

