

**27th Annual Blue Ridge Highlands Regional Science Fair
March 2 - 3, 2018 – Radford University**

AWARDS BY CATEGORY

Grand Award Winners

- 405 Raaga Unmesha Vullikanti
Peptide Nucleic Acids as Potential Designer Antimicrobials
Blacksburg High School
Sponsor: Katharine Davis
- 1301 Brandon Fan
Using Deep Learning to Return Critical Documents for Clinical Decision Support Systems
Blacksburg High School
Sponsor: Katharine Davis

Grand Award Alternate

- 703 Elijah Hodges, Liam Lawrence, and Siddharth Nathella
Genesis of an Isolated High Dynamic Range Video System
Blacksburg High School
Sponsor: Katharine Davis

SENIOR DIVISION

ANIMAL SCIENCES

First Place

- 102 Jeanette Reed
Paw-ness in Pure and Mixed Breed Canines
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

- 101 Tyler Kwak
Analyzing the Effects of Lead and Maltol on the Visual Behaviors of the Brain in *Xenopus laevis* Tadpoles
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Third Place

103 Ryan Vandyke and Jessie Lester
Do Worms Prefer Light or Dark?
Richlands High School
Sponsor: Tiffany Stillwell

BEHAVIORAL AND SOCIAL SCIENCES

First Place

205 Audra White
The Effect of an OXTR Gene Variant on Empathy In Female Adolescents
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

203 Zoe Mathis
Openness to Experience Among Age Groups and Gender Relations
Southwest Virginia Governor's School
Sponsor: Sherry Pugh

Third Place

204 Sydney Stephens
The Effectiveness of Clickbait on Students
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Honorable Mention

202 Ben June
Soliciting Requirements for a Music Search-Engine for Band Directors
Blacksburg High School
Sponsor: Katharine Davis

BIOMEDICAL AND HEALTH SCIENCES

First Place

303 Shay Ladd
Astrocyte Response to Traumatic Brain Injury
Blacksburg High School
Sponsor: Katharine Davis

Second Place

306 Senah Stephens
The Effect of Palm Kernel Oil On Streptococcus mutans in In Vitro Oil-Pulling Techniques
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann

Third Place

- 304 Victoria Pratt-Myers
Variation in the COMP Gene and its Association With Ligament Sprains and Tendon Sprains
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

CELLULAR AND MOLECULAR BIOLOGY

First Place

- 405 Raaga Unmesha Vullikanti
Peptide Nucleic Acids as Potential Designer Antimicrobials
Blacksburg High School
Sponsor: Katharine Davis

Second Place

- 401 Xavia Arnold
Association of the CHRNA4 Gene Variants and Smoking Habits
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Third Place

- 404 Rosa Maria Lovo
Monitoring the Growth of Kombucha SCOBY's in Various Types of Tea
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann

CHEMISTRY

First Place

- 508 Kathleen Reuwer
Potential Hazardous Hexavalent Chromium Exposure From the Sharpening of Ice Skate Blades
Southwest Virginia Governor's School
Sponsor: Jared Brown

Second Place

- 501 Drew Ayers
A Study on the Physical and Functional Properties of Surfactants and Their Incorporation into Biscuit Making
Southwest Virginia Governor's School
Sponsor: Jared Brown

Third Place

- 504 James Crewey
Effects of Chemical Sorbents on Varied Concentrations of Water-Ethanol Solutions
Southwest Virginia Governor's School
Sponsor: Jared Brown

Honorable Mention

- 503 Christopher Todd Cochran
The Effects of Alcohol Oxygenates on the Energy Density of Gasoline
Southwest Virginia Governor's School
Sponsor: Jared Brown
- 507 Dawson Little
Comparing the Effect of Types of Catalyst on Biodiesel Quality
Southwest Virginia Governor's School
Sponsor: Jared Brown

EARTH AND ENVIRONMENTAL SCIENCES

First Place

- 602 Ainsley LaPlante
Effects of Gasoline on Pavona frondifera and Montipora capricornis Corals
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Second Place

- 604 Olivia Smoot
Water Toxicity Test of a Rural Area Using Daphnia Magna
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann

Third Place

- 601 Nicholas Harvey
Self-Assembled TiO₂/Polyelectrolyte Composite Films for Catalytic Photodegradation of Pollutants
Southwest Virginia Governor's School
Sponsor: Jared Brown

Honorable Mention

- 603 Andrew Rhys Lewis
Using Algae to Modify the Atmosphere of Mars
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

EMBEDDED SYSTEMS

First Place

703 Elijah Hodges, Liam Lawrence, and Siddharth Nathella
Genesis of an Isolated High Dynamic Range Video System
Blacksburg High School
Sponsor: Katharine Davis

Second Place

702 Collin Gray
The Effects of Different Computer Components on Computer Efficiency
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Third Place

701 Ethan Dehoff
MatLab Simulation of FMCW Radar: Noise and Signal Processing
Blacksburg High School
Sponsor: Katharine Davis

ENGINEERING MECHANICS ENVIRONMENTAL ENGINEERING

First Place

805 Alexander Tomiak
Comparing Methods of Glare Reduction from HID Headlights in External Rearview Mirrors
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Second Place

804 Isabelle Hollars
Designing Cost Effective, Spill-Proof, and Shatter-Proof, Drinking Vessels for People Diagnosed with Parkinson's Disease
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Third Place

801 Alexandra Barrett
Biomechanic Simulations to Understand the Behavior of Lift-Assist Exoskeletons
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Honorable Mention

802 Camden Brewer
Hydrophobic Alto Saxophone Pads
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

MATHEMATICS

First Place

902 Sam Coulson
The Influence of Budgeting on Financial Aid in Higher Institutions
Southwest Virginia Governor's School
Sponsor: Greg Riffe

Second Place

901 Nicholas Agud
A Three-Dimensional Model of the Moving Sofa Problem
Southwest Virginia Governor's School
Sponsor: John Jaroma

MICROBIOLOGY

First Place

1005 Brittany Stiefel
Prevalence of Antibiotic Resistance in the Gut Flora (Enterobacteriaceae) of Wild and Domesticated Horses
Southwest Governor's School
Sponsor: Catherine Spachmann

Second Place

1003 Stevie Lowe
Comparisons of Antibacterial Activity of Amphibian Epidermal Secretions Against E. coli
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann

Third Place

1001 Simonne Guenette
The role of trehalose in heat-resistant Mycobacterium avium
Blacksburg High School
Sponsor: Katharine Davis

Honorable Mention

1006 Tristan Conner Williams
An Analysis of the Effectiveness of Small Scale Egg Washing Methods
Southwest Virginia Governor's School
Sponsor: Catherine Spachmann

PHYSICS AND ASTRONOMY

First Place

1102 Reegal Shailesh Patel
The Effects of Introducing Non-Newtonian Fluids Into Football Helmet Padding On Impact Forces
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Second Place

1101 Jake Mitchell
Bent Versus Bermuda Grass on Golf Greens and How They Affect the Friction Created by the Golf Ball
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

Third Place

1103 Noah Whitlow
Shock Distribution of Common Substances
Southwest Virginia Governor's School
Sponsor: Matthew Frazier

PLANT SCIENCES

First Place

1203 Sophia Link
The Role of Inositol Phosphates on Plant Development and Stress Response
Blacksburg High School
Sponsor: Katharine Davis

Second Place

1206 Anya Robbins
The Effects of Acid Rain on Foliage and Prevention Using Calcium Carbonate
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

Third Place

1202 Aleah Goodson

The Effects of Water from Various Sources on Plant Growth

Southwest Virginia Governor's School

Sponsor: Catherine Spachmann

Honorable Mention

1201 Makayla Goines

Phytoremediation of Iron from Water by Hydroponically Grown Brassica Juncea

Southwest Virginia Governor's School

Sponsor: Jared Brown

**ROBOTICS AND INTELLIGENT MACHINES
SYSTEMS SOFTWARE**

First Place

1301 Brandon Fan

Using Deep Learning to Return Critical Documents for Clinical Decision Support Systems

Blacksburg High School

Sponsor: Katharine Davis

Second Place

1302 Aaron Vickers

Prediction of Aerodynamic Forces Using Machine Learning

Southwest Virginia Governor's School

Sponsor: Matthew Frazier

JUNIOR DIVISION

ANIMAL SCIENCE & EARTH AND ENVIRONMENTAL SCIENCE

First Place

2002 Bryce Havens

Tackling Toxic Taps

Graham Middle School

Sponsor: Holly Smith

Second Place

2001 David Altizer

The Effect of Water Runoff on Soil Types and Erosion

Classical Conversations

Sponsor: Karen Altizer

Third Place

2003 Tina Huang
Paper Chromatography with Creek Water
Tazewell Middle School
Sponsor: Loretta Hypes

Honorable Mention

2004 Jenna Ramey
How do oil spills affect marine life?
Riverview Elementary Middle School
Sponsor: Kay Ratliff

2005 Keyonna Rhodie
Does the Ph Level Affect Mosquito Growth?
Tazewell Middle School
Sponsor: Loretta Hypes

CHEMISTRY

First Place

2102 Emelyn Koene
Laundry Detergents
Dayspring Christian Academy
Sponsor: Bryan Koene

Second Place

2106 Jacob White
Explosion of Corrosion
Graham Middle School
Sponsor: Holly Smith

Third Place

2104 Zeke Phipps
Effects of Temperature on Luminol: Is it bright glow or slow glow?
Independence Middle School
Sponsor: Stacy Phipps

Honorable Mention

2108 Grant R. Williams
Effect of Butter Temperature on Chocolate Chip Cookies
Classical Conversations
Sponsor: Robert C. Williams

ENERGY: PHYSICAL

First Place

2203 Hannah E. Cook
The Science of Popcorn: A Look at Popping Efficiency
Classical Conversations
Sponsor: Laura P. Cook

Second Place

2206 Russell Alan Sarver
Ready Aim Fire
Classical Conversations
Sponsor: Judy Sarver

Third Place

2202 Jonathan Collier
Solar Power: Is It Too Hot?
Tazewell Middle School
Sponsor: Loretta Hypes

Honorable Mention

2201 Caleb Altizer
The Effectiveness of a 10v Solar Panel on a 12v Battery
Classical Conversations
Sponsor: Karen Altizer

2204 Ansley Ohanian
Is the Dark Side Warmer
Classical Conversations
Sponsor: John Ohanian

ENGINEERING MECHANICS ENVIRONMENTAL ENGINEERING

First Place

2301 Jackson Brockman
Nailed It
Classical Conversations
Sponsor: Sarah Brockman

Second Place

2303 Joseph E. Trout

Go the Distance: Comparing the Flight Distances of 3 Paper Airplane Designs

Classical Conversations

Sponsor: Jess Trout

Third Place

2302 Nathan J. Cook

To Drink or Not to Drink: Water Quality in Montgomery County

Classical Conversations

Sponsor: Laura Cook

MATERIALS SCIENCE

First Place

2402 Aiden Stout

To Burn or Not to Burn: That is the Question

Graham Middle School

Sponsor: Holly Smith

Second Place

2403 Kayla Waters

Egg Substitutes

Classical Conversations

Sponsor: Danielle Waters

Third Place

2401 Gracie Firgau

How Does the Amount of Activator Affect the Slime?

Galax High School

Sponsor: Kathryn Pakkidis

PHYSICS AND ASTRONOMY

First Place

2501 Nathan Coburn

Insulated Ice

Classical Conversations

Sponsor: Peggy Coburn

Second Place

2503 Janalyn Vance

Radioactive Texts

Wallace Middle School

Sponsor: Shannon Mutter

Third Place

2502 Isaac Rich

Blocked Signal

Classical Conversations

Sponsor: Lindsay Rich

PLANT SCIENCES

First Place

2601 Jonathon Altizer

The Effect of Light Intensity on Plant Growth

Classical Conversations

Sponsor: Karen Altizer

Second Place

2603 Jacob Slabach

Organic: Certified vs. Local

Classical Conversations

Sponsor: Audra Slabach

Third Place

2602 Boston Rosborough

The Effects of Colored Light on Plant Growth

Homeschool

Sponsor: Rani Rosborough