34th Blue Ridge Highlands Regional Science Fair

March 7-8, 2025
Radford University

Commemorating 75 years of discovery and innovation with the National Science Foundation

COLLEGE OF AGRICULTURE AND LIFE SCIENCES
VIRGINIA TECH

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The College of Agriculture and Life Sciences offers 21 B.S. majors, 12 graduate programs, and a two-year A.A. degree to provide you with unique hands-on classes and experiences, personalized academic advising, the opportunity to focus on what matters to you, and a future to grow into.

Table of Contents

Schedule of Events

Friday, March 7, 2025

4:00 p.m. – 6:00 p.m.	Student registration – Center for the Sciences lobby, next to Planetarium Setup and SRC approval - CS M56, M57, M58, M59, M65, M70

Saturday, March 8, 2025

7:30 a.m. – 8:00 a.m.	Final adjustments to exhibits by student exhibitors – Center for the Sciences M56, M57, M58, M59, M65, M70
8:00 a.m. – 8:30 a.m.	Student check-in – Reed Atrium; Students wait in Curie 142
9:00 a.m. – 11:30 a.m.	Judge interviews with student exhibitors – Center for the Sciences M56, M57, M58, M59, M65, M70
11:30 am – 12:00 p.m.	Judge interview with Grand Award finalists – Center for the Sciences M56, M57, M58, M59, M65, M70
12:00 p.m.	Student lunch – Curie 142 and atrium Dr. Webster's Magic of Chemistry
1:00 p.m. – 2:45 p.m.	Exhibits open to public – Center for the Sciences M56, M57, M58, M59, M65, M70
3:00 p.m.	Awards Ceremony -- Bondurant Auditorium, Preston Hall
After awards	Take down projects – Center for the Sciences M56, M57, M58, M59, M65, M70

HIGHLANDER RESEARCH ROOKIES

Research Rookies offers high-achieving, highly motivated students great opportunities for hands-on research during their first and second years at Radford.

Radford UNIVERSITY

Benefits of Research Rookies

- Earn a $4,000 stipend over 2 years
- Develop career readiness skills
- Work alongside experienced faculty
- Learn about research in your area of interest
- Gain opportunities to present your research

Eligibility Requirements

- Incoming or transfer undergraduate status
- Commitment to participate in both fall and spring semesters
- 3.50 GPA
- Curiosity, independence and reliability

For more information:

ours@radford.edu

Radford UNIVERSITY | Office of the President

March 3, 2025

Greetings Participants and Families!

It is my honor to welcome you to Radford University and to the 34th annual Blue Ridge Highlands Regional Science Fair. You represent the next generation of scientists, innovators, entrepreneurs and inventors, and we admire your passion for making the world a better place.

Radford University has been the proud host of the Blue Ridge Highlands Regional Science Fair since 2011. Each year, we have enjoyed experiencing how creativity, problem solving and insightful observations from students across our region can lead to amazing discoveries.

At Radford University, exploration is a way of life. For more than 100 years, we have inspired curiosity, independence and fearlessness in our students. Scientists benefit most from the freedom to try new things, to conduct research and to learn from experience – this is what we offer to all students at Radford University. Our faculty members are invested in your success and will support you at every step of your academic journey.

Most importantly, Radford University offers research and work-based learning opportunities, available from day one, that will broaden your perspectives and can even take you to new parts of the world! Over the past year, Radford student researchers have explored the Arctic Circle, Amazon rainforest, Argentina, and our home here in the Appalachian Mountains, which is one of the most biodiverse regions in the world.

We invite you and your family members to see what Radford University has to offer by walking through our beautiful campus or striking up a conversation with our friendly students and faculty to learn more about the Radford experience.

Best wishes to all for a successful science fair and a bright future!

Tartan Proud,

President Bret Danilowicz

Radford University | Artis College of Science and Technology

March 8, 2025

Dear Student Scientists and Guests,

On behalf of the Artis College of Science and Technology (ACSAT) and Radford University, we are thrilled to host the 34th Annual Blue Ridge Highlands Regional Science Fair! We are excited to see the next generation of scientists present their projects. We hope that you enjoy our facilities and take some time to see our laboratories and instrumentation.

The Artis College houses eight departments and offers undergraduate degrees across the sciences, along with a Master's Degree in Data and Information Management. The key feature of our College is the opportunity for students to engage in authentic research as early as the freshman year. Many students make presentations at regional and national conferences, and some graduate as co-authors in peer-reviewed publications. If you are interested in a degree in Anthropology, Biology, Chemistry, Computer Science, Cybersecurity, Geospatial Science, Geology, Mathematics and Statistics, or Physics, in a program that offers you hands-on experience with state-of-the-art instrumentation taught be professors who care about you as a person and as a student, please consider applying to Radford University.

I hope that you find the events of the Science Fair exciting, invigorating, and inspirational. The faculty and staff of the Artis College are inspired by your work and presentations today. I welcome you to come back and visit the campus, take a tour, sit in on a class, and see what Radford University and the Artis College of Science and Technology have to offer you.

Sincerely,

Steven M. Bachrach
Dean

INTRODUCTION

Science fairs have roots that go back to the 1940s, when they were used to encourage talented high school seniors to pursue a career in science or engineering and to expose the public to scientific work. Today, science fairs are still used to nurture an interest in the sciences, but have expanded to include younger students.

Through poster displays and oral presentations, young scientists present the results of their hard work in the fields of animal sciences, behavioral and social sciences, biochemistry, biomedical and health sciences, biomedical engineering, cellular and molecular biology, chemistry, computational biology and bioinformatics, earth and environmental sciences, embedded systems, energy: chemical, energy: physical, engineering mechanics, environmental engineering, materials science, mathematics, microbiology, physics and astronomy, plant sciences, robotics and intelligent machines, systems software, and translational medical science. This stimulates an active interest in science and engineering in young students, provides an unparalleled experience in research and presentations, and exposes the public to the hard work these students are performing.

With the 34th Annual Blue Ridge Highlands Regional Science Fair, we are continuing a long-standing tradition of scientific exploration and promotion. Participants in this fair represent the counties of Buchanan, Dickenson, Floyd, Giles, Grayson, Montgomery, Pulaski, Russell, Tazewell, Wythe and the cities of Galax, and Radford. Students will compete in either the Junior (6th through 8th grades) or Senior (9th through 12th grades) Division.

The Grand Award winners (the top two Senior Division projects) will participate in the International Science and Engineering Fair (ISEF) to be held in Columbus, OH May 10 - 16, 2025. The Grand Award winners will compete against 1,800 high school students from over 75 countries for approximately $4 million in prizes.

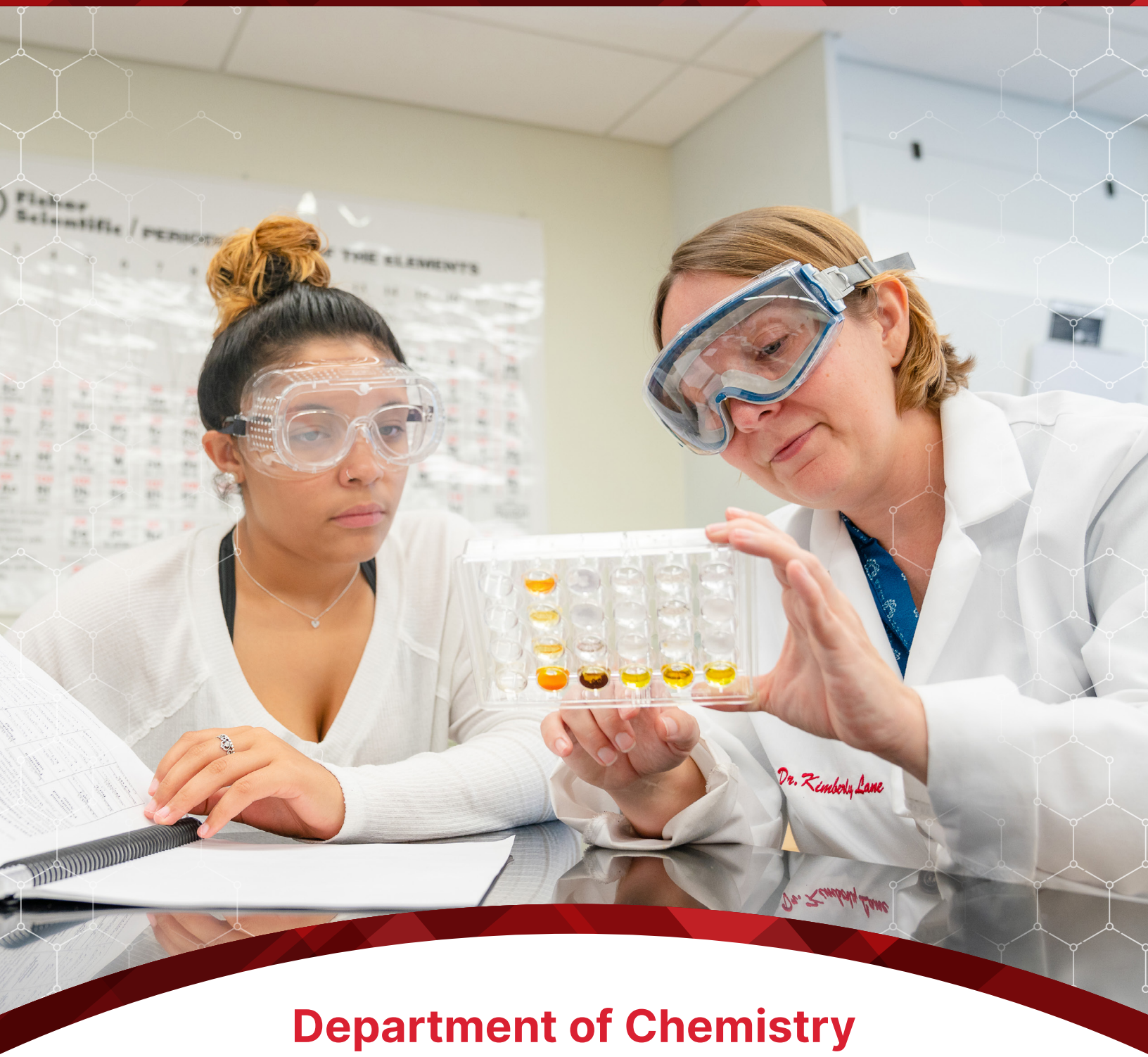
The First Place winners in each senior category will receive an invitation to participate in the Virginia State Science and Engineering Fair at Piedmont Virginia Community College in Charlottesville, VA April 4 - 5, 2025.

The top winners in the junior division will receive an invitation to submit an application to compete in the Thermo Fisher Junior Innovator Challenge, with the national finalists competing on October 2025 in Washington, DC.

Christine K. Hermann — Dr. Christine Hermann

Kimberly J. Lane — Dr. Kimberly Lane

Radford University | Artis College of Science and Technology



Department of Chemistry

- Hands-on experience with state-of-the-art instrumentation
- Undergraduate research opportunities with faculty guidance
- Program approved by the American Chemical Society (ACS)

Special Awards and Scholarships

American Association of University Women Awards
Top two females will be awarded $50 in one of the following categories: Biochemistry, Chemistry, Medicine & Health, Microbiology (Senior Division).

American Chemical Society, Tennessee Virginia Highlands Section Awards
Best three individual projects exhibiting the best and most extensive use of chemistry in any category will be awarded a monetary prize [$100 (1st), $75 (2nd), and $50 (3rd)] (Senior Division).

American Chemical Society, Virginia Blue Ridge Section Award
This award will recognize the best project in chemistry or a related field in each division. One $100 gift card will be given in the Junior Division and one $200 award will be given in the Senior Division.

American Psychological Association Award
This award will be given for the best individual project with outstanding achievement in research in psychological sciences under the category of Behavioral and Social Science or any category relating to psychology (Senior Division).

American Red Cross Award – New River Valley; Science in Service to Our Communities
This award with be given for the best individual project that meets one of the following criteria: blood or biomedical research, community health initiative, or disaster prevention or research.

American Society of Biochemistry and Molecular Biology Award
This award is to be awarded to a high school student based on their performance in the area of biochemistry and molecular biology. A $50 check will be mailed to the student (Senior Division).

American Society of Mammalogists Awards
Every participant whose project is specifically studying mammals is eligible.
The focus of the experiment is the mammal (whether it is wild, domesticated, or lab), not incidental to the experiment.

Association of Women Geoscientists Award
The top individual female who most exemplifies high standards of innovativeness and scientific excellence in the geosciences and/or earth sciences will receive this award (Senior Division).

Biomedical Engineering Award - Virginia Tech
The best individual or group project that displays ingenuity, creativity, and detailed design in a project that has application to helping the human body will receive this award. Although the Biomedical Engineering category will be judged thoroughly, the award can be given to a project in any category. The award is given by the Biomedical Engineering Chapter at Virginia Tech (Senior Division).

Genius Olympiad
Two awards (two individual awards or two-person team) will be given for individual excellent work on environment, such as ecology and biodiversity, environmental quality, resources and energy, and human ecology. Winners have the opportunity to compete in the GENIUS OLYMPIAD, June 2025 (Senior Division).

Iota Sigma Pi Awards
Iota Sigma Pi is a national honor society for women in chemistry. Its major objectives are to promote interest in chemistry among women students; to foster mutual advancement in academic, business, and social life; and to stimulate personal accomplishment in chemical fields. This award is to recognize an outstanding project by a female student in the areas of chemistry, biochemistry, or a related science. One $25 award will be given in the Junior Division and one $50 award will be given in the Senior Division. This award will be given by Dr. Christine Hermann, the National Vice President of Iota Sigma Pi.

Lemelson Early Inventor Prize
The award winner will have to demonstrate the creation of an invention. An invention is a novel or unique device, process, or method. It could be an improvement on an exciting product or a new process for creating a tangible product. The project must incorporate identifying a problem, problem-solving, designing and prototyping a unique solution, entrepreneurial and inventive mindsets, and sustainable solutions. A $100 check will be mailed to the winning student or team (Junior Division).

Mount Tabor Ruritan Club Awards
These awards will be given to an environmentally related research project with the potential for the most direct impact on the local New River Valley. One $50 award will be given in the Junior Division and two $100 awards will be given in the Senior Division.

National Aeronautics and Space Administration Earth System Science Award
The award will be presented to the student whose individual project incorporates studies including different spheres of the Earth system, their interactions and change over time. It should include cause-effect relationships based on evidence and demonstrate a clear understanding of how those relationships affect Earth as a system (Senior Division).

National Oceanic and Atmospheric Administration Award
The National Oceanic and Atmospheric Administration Award will be awarded to the best individual project focused on ecosystems, climate, weather and water, and commerce and transportation.

National Weather Service Award
A rain gauge will be awarded for the best individual project that is best geared towards the National Weather Service's mission. Provide weather, water and climate data, forecasts, warnings, and impact-based decision support services for the protection of life and property and enhancement of the national economy.

Office of Naval Research Awards Distinguished Achievement Awards
Two medallions will be given in the Junior Division and three medallions will be given in the Senior Divisions for the best individual projects in the disciplines of science and engineering. Winners in the Senior Division will also receive $50.

Radford University Sigma Xi Chapter Distinguished Awards in Science
These individual awards recognize outstanding application of the scientific method to address a research problem. One $50 award will be given in the Junior Division and one $50 award will be given in the Senior Division. This award is sponsored by the Sigma Xi Chapter at Radford University.

Regeneron Biomedical Science Award
The winning individual project should demonstrate an impressive command of the biomedical sciences and Regeneron's core values. The judging criteria includes a) Lead with Science, b) Take on Big Ideas, c) Make it Happen, d) Be Great Together, and e) Do What's Right. The winner will receive $375 (Senior Division).

Ricoh Corporation Sustainable Development Award
This individual award recognizes the project with the best outstanding effort in addressing issues of environmental responsibility and sustainable development in a science and engineering project. The award recognizes a quest for new discoveries and to work with the community to inspire a vision of a more sustainable future (Senior Division).

Society for In Vitro Biology
This award is presented to the most outstanding 11th grade student exhibiting in the areas of plant or animal in vitro biology or tissue culture.

Stockholm Junior Water Prizes
The award is for the three best water-related individual science projects at the high school level. The competition is open to science projects aimed at enhancing the quality of life through the improvement of water quality, water resource management, or water and wastewater treatment. Research projects are assessed based on six different criteria: relevance, creativity, methodology, subject knowledge, practical skills, and report /presentation. The National SJWP winner receives $10,000, a trophy, and an all-expense paid trip to Stockholm, Sweden to compete in the international competition. The international winner receives a cash prize of $15,000, a cash prize of $5,000 for their school, and the international trophy. First place winner will receive $200 and second place winner will receive $100 (Senior Division).

Thermo Fisher Scientific Junior Innovators Awards
The Thermo Fisher Scientific Junior Innovators Challenge (JIC) is the nation's premier STEM research competition for 6th, 7th and 8th grade students. The top 10% of students competing here today have the honor of continuing their science fair journey by applying to compete in the Thermo Fisher JIC. From the entrants, the Top 300 Junior Innovators will be selected and will receive a prize of $125. From the Top 300, thirty finalists will be selected and compete for more than $100,000 in prizes, including a top prize of $25,000 and scholarships for STEM summer camps. Additionally, each of the finalists' schools receive $1,000 (Junior Division).

United States Agency for International Development Award
The award is given to the best individual project that shows the extent to which the project is relevant to international development programming and priorities. This may include projects in 1) agriculture and food security; 2) democracy, human rights, and governance; 3) economic growth and trade; 4) education; 5) environment, energy, and infrastructure; 6) gender equality and women's empowerment; 7) global health; 8) humanitarian assistance; 9) innovation, technology, and research; 10) nutrition; 11) water and sanitation (Senior Division).

United States Air Force Award
Four outstanding science or engineering individual projects will receive a sling pack, power bank, USB flash memory drive, USB car charger, and official Air Force certificate (Senior Division).

United States Environmental Protection Agency
A letter will be given to students who have projects in the areas of environmental sciences and environmental engineering. This letter is not considered an award, but information to these students (Senior Division).

United States Metric Association Award
This award will be given to the student whose individual project involves a significant amount of quantitative measurement and should use the units of the SI metric system for those measures. The subject of the project should not be the SI system itself (Senior Division).

VCOM-Virginia Public Health and Healthcare Award
The awards are for individual projects that exhibit innovation in identifying and treating health related problems in rural populations. For the Junior Division, certificates and cash awards of $100 (1st), $75 (2nd), $50 (3rd), and $25 (Honorable Mention) will be awarded for the top winners. For the Senior Division, certificates and cash awards of $150 (1st), $100 (2nd), $50 (3rd), and $25 (Honorable Mention) will be awarded for the top winners.

Virginia Lakes and Watersheds Award
Awards are offered to individual earth/environmental individual science projects related to watershed and water resource management, and/or stormwater projects as they relate to water quality investigations. The junior division winner will receive a $75 gift card and the senior division winner will receive a $150 gift card.

Yale Science and Engineering Association Award
This award will be given to the most outstanding 11th grade student exhibiting in the areas of Computer Science, Engineering, Physics or Chemistry.

Emory and Henry Scholarship
A $1000 scholarship will be awarded to a student.

New River Community College Scholarship
A $1000 scholarship will be awarded to student living in Giles, Floyd, Pulaski, or Montgomery Counties or Radford City, 12th grade only.

Radford University Scholarships
Two $2000 renewable scholarship will be awarded to residents of Virginia. The scholarship is renewable for three years with a 3.2 GPA at Radford University.

Wytheville Community College Scholarship
A $2000 scholarship will be awarded to a senior from the Wytheville Community College service area (Bland, Carroll, Grayson, Smyth, and Wythe counties).

Thinking of Medical School?

Consider the college in Blacksburg, Virginia that advances scientific knowledge through medical research.

The Edward Via College of Osteopathic Medicine (VCOM), fosters a culture of student and faculty growth and institutional excellence, by supporting research, innovation, and scholarly work.

Our active research areas include **pharmacology**, **immunology**, **sports medicine**, **preventive medicine** and **public health**. We also carry out innovative outreach projects in education, rural health and international health.

Students are encouraged to conduct research in a rich mentoring environment to gain experience in basic and applied research and advance scientific knowledge. Upon graduation, VCOM graduates have the unique opportunity to be awarded a Doctor of Osteopathic Medicine degree with a Research Distinction designation when meeting the benchmarks of the research program.

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www.vcom.edu/research

VCOM

Edward Via College of Osteopathic Medicine

VIRGINIA • CAROLINAS
AUBURN • LOUISIANA

VCOM supports the Blue Ridge Highlands Regional Science Fair in its long-standing tradition of scientific exploration and promotion.

Grand Award Winners

2024
Xavier Gitre
Blacksburg High School
Ethan Ririe
Blacksburg High School

2023
Jesse Dulany
Southwest Virginia Governor's School
Davis Reitzel
Southwest Virginia Governor's School

2022
Jacqueline Hou
Blacksburg High School
Brock Duma
Blacksburg High School

2021
Shoshana Elgart
Blacksburg High School
Katelyn Collett
Southwest Virginia Governor's School

2020
Claire Morton
Blacksburg High School
Virginia Worrell
Southwest Virginia Governor's School

2019
Brandon Fan
Blacksburg High School
Ainsley LaPlante
Southwest Virginia Governor's School

2018
Raaga Unmesha Vullikanti
Blacksburg High School
Brandon Fan
Blacksburg High School

2017
Kaelum Hasler
Blacksburg High School
Carly Porter and Morgan Fisher
Southwest Virginia Governor's School

2016
Emily Llaneras
Southwest Virginia Governor's School
Julian Elmasry
Southwest Virginia Governor's School

2015
Emily Llaneras
Southwest Virginia Governor's School
Ashley Jordan and Austin Owen
Southwest Virginia Governor's School

2014
Jordan Kuhn and Eric Chang
Southwest Virginia Governor's School
Meredith Dove and Keena Shang
Blacksburg High School

2013
Jordan Kuhn and Eric Chang
Southwest Virginia Governor's School
Thomas Grey Quesenberry
Southwest Virginia Governor's School

2012
Kevin Kabaria
Richlands High School
Jiyun Chang and Jeremy Kuhn
Southwest Virginia Governor's School

2011
Taylor Hay
Southwest Virginia Governor's School
Heming Zhao
Southwest Virginia Governor's School

2010
Alex Granata
Southwest Virginia Governor's School
Biyuan Zhao
Southwest Virginia Governor's School

2009
Jacob Harvey
Southwest Virginia Governor's School
Tian Zhou
Southwest Virginia Governor's School

2008
Sanjay Kishore
Southwest Virginia Governor's School
Laura Vogelaar
Southwest Virginia Governor's School

2007
Christopher Long
Home Educators of the New River Valley
Josh McCann
Southwest Virginia Governor's School

2006
Christopher Long
Home Educators of the New River Valley
Erin Long
Home Educators of the New River Valley

2005
Loren Liebrecht
Southwest Virginia Governor's School
Ryan Olson
Southwest Virginia Governor's School

2004
Ryan Olson
Southwest Virginia Governor's School
Brian Rice
Southwest Virginia Governor's School

2003
Amy Kabaria
Richlands High School
Brian Rice
Southwest Virginia Governor's School

2002
Thomas Berenato
Blacksburg High School
Shelly Cecil
Tazewell High School

2001
Courtney Cecil
Tazewell High School
Bradford Malbon
Blacksburg High School

2000
Joel R. L. Meeks-Matous
Giles County High School
Nisha Nagarkatti
Blacksburg High School

1999
Nisha Nagarkatti
Blacksburg High School
David W. Rakestraw
Southwest Virginia Governor's School

1998
Jessica DeBusk
Southwest Virginia Governor's School
Nisha Nagarkatti
Blacksburg High School

1997
Nisha Nagarkatti
Blacksburg High School
Kelly E. Seaton
Dayspring Christian Academy

1996
Amanda D. Alley
Southwest Virginia Governor's School
Shannon L. Hughes
Carroll County High School

1995
Jefferson L. Carpenter
Southwest Virginia Governor's School
Setul G. Patel
Narrows High School

1994
James W. Clark
Southwest Virginia Governor's School
Sarah L. Simpkins
Southwest Virginia Governor's School

1993
Brooks Moses
Southwest Virginia Governor's School
Carla Sue Rogers
Pulaski County High School

1992
Jia Liu
Southwest Virginia Governor's School
Garnett Edwin Simmers
Southwest Virginia Governor's School

Compete in the

Blue Ridge Highlands Regional Science Fair

You can win cash prizes, trophies, ribbons, and other awards!

Winners may go on to compete in:

Thermo Fisher Junior Innovators Challenge
September - October 2025

Thermo Fisher Scientific
Junior Innovators Challenge
A program of Society for Science

Virginia State Science & Engineering Fair
April 4 - 5, 2025

Virginia State Science & Engineering Fair

International Science & Engineering Fair
May 11 - 17, 2025

REGENERON ISEF
A PROGRAM OF SOCIETY FOR SCIENCE & THE PUBLIC

PVCC Opportunity. Access. Excellence.
PIEDMONT VIRGINIA COMMUNITY COLLEGE

The top two senior projects win the Grand Award and are eligible to attend ISEF 2025!

ISEF participants get to meet Nobel Prize Lauraetes, meet students from over 80 countries, and compete for nearly $5 million in prizes!

Support the Blue Ridge Highlands Regional (BRHR) Science Fair!

The BRHR Science Fair is funded completely by donations – there is no charge to participants.

If you would like to make a gift to support the BRHR Science Fair, please visit connect.radford.edu/brhrsf or contact us at sciencefair@radford.edu.

Thank you for investing in promising science students and making this transformative experience available for years to come!

Judges

We thank all of the judges that make the science fair successful!

Preeya Achari
School of Biomedical Engineering and Sciences
Virginia Tech

Mary Opeyemi Adebote
Department of Fish and Wildlife Conservation
Virginia Tech

Timilehin Adegboyega
Department of Chemistry
Virginia Tech

Foster Agyei
Department of Biological Sciences
Virginia Tech

Toheeb Ajasa
Department of Chemistry
Virginia Tech

Abduljeleel Ibidapo Ajibona
Department of Mining and Minerals Engineering
Virginia Tech

Josephine Altman-Feeney
Edward Via College of Osteopathic Medicine

Ramzi Badra
Edward Via College of Osteopathic Medicine

Omolara Adeola Bakare
Department of Physics
Virginia Tech

Elina Baltins
Edward Via College of Osteopathic Medicine

Garrett Bangert
Department of Biomedical Engineering
Virginia Tech

Dr. Bastiaan Bargmann
School of Plant and Environmental Sciences
Virginia Tech

Dr. Ian Barland
School of Information and Computing Science
Radford University

Madi Bautista
Edward Via College of Osteopathic Medicine

Brooklyn Beck
Department of Aerospace and Ocean Engineering
Virginia Tech

Emma Blanco
Department of Chemistry
Virginia Tech

Romy Boortalary
Edward Via College of Osteopathic Medicine

Avraham Boruchowitz
Environmental Health and Safety
Radford University

Alexandra Campbell
Virginia Tech Carilion School of Medicine

Macy Carleton
Edward Via College of Osteopathic Medicine

Benjamin Chaback
Department of Engineering Education
Virginia Tech

Connor Chapman
Edward Via College of Osteopathic Medicine

Dr. Caitlyn Collins
Department of Biomedical Engineering and Mechanics
Virginia Tech

Dr. Coco/Keyu Ding
Department of Physics
Virginia Tech

Eddie Dixon
Edward Via College of Osteopathic Medicine

Hailey Dunster
Edward Via College of Osteopathic Medicine

Emma Frye
Virginia Tech School of Medicine

Connor Gallagher
Department of Chemistry
Virginia Tech

Dr. Graham Glynn
Department of Biology
Radford University

Cassie Grossman
Edward Via College of Osteopathic Medicine

Morgan Gunter
Department of Chemistry
Virginia Tech

Dr. George Harakas
Department of Chemistry
Radford University

Dr. Elise Hennessy
Department of Biomedical and Veterinary Sciences
Virginia Tech

Joshua Heuler
Department of Biological Sciences
Virginia Tech

Taryn Houghton
Edward Via College of Osteopathic Medicine

Patrick Hurd
Edward Via College of Osteopathic Medicine

Shruti Idnani
Edward Via College of Osteopathic Medicine

Xakin Ramirez Isunza
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Virginia Tech

Sai Kannan
Edward Via College of Osteopathic Medicine

Sara Karami
Edward Via College of Osteopathic Medicine

Betül Karanfil
Department of Chemical Engineering
Virginia Tech

Antarjot Kaur
Department of Engineering Education
Virginia Tech

Ruwanthika Kularathna
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Virginia Tech

Jubel Kurian
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Amy Lim
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Virginia Tech

Victor Lopez
Department of Biomedical Engineering and Mechanics
Virginia Tech

Tanner Lydic
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Dr. Sam Margherio
Department of Psychology
Virginia Tech

James May
Virginia Maryland College of Veterinary Medicine

Sheridan McNeill
Edward Via College of Osteopathic Medicine

Madison Moore
Edward Via College of Osteopathic Medicine

Nishita Muppidi
Edward Via College of Osteopathic Medicine

Afolabi Olayiwola
Department of Chemistry
Virginia Tech

Ibukun Olusola
Department of Physics
Virginia Tech

Reegal Patel
Lockheed Martin Space: Deep Space Exploration

Sohum Patel
Edward Via College of Osteopathic Medicine

Carl Potter II
Edward Via College of Osteopathic Medicine

Rumana Islam Rani
Department of Chemistry
Virginia Tech

Jitender Rathore
School of Plant and Environmental Sciences
Virginia Tech

Dr. Kristofer Rau
Virginia Tech Carilion School of Medicine

Jean Reagan
Edward Via College of Osteopathic Medicine

Jazmin Rio
Edward Via College of Osteopathic Medicine

Brooke Scardina
Edward Via College of Osteopathic Medicine

Dr. Alan Sentman
SGS Polymer Solutions

Edward Shangin
Department of Biomedical Engineering
Virginia Tech

Kyle Shiekh
Department of Engineering Education
Virginia Tech

Dr. Gary Silverman
Professor Emeritus
Bowling Green State University and University of North Carolina Charlotte

Dr. Marian Silverman
Retired

Laura Simpson
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Virginia Tech

Ritika Singh
Department of Biomedical Engineering
Virginia Tech

Dennis Sleighter
National Weather Service

Jacob Stewart
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Emma Wiese
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Department of Biological Sciences
Virginia Tech

Jacob Wilson
Department of Mechanical Engineering
Virginia Tech

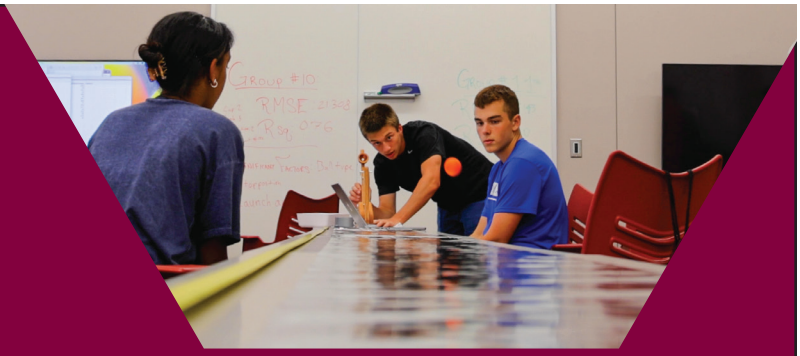
Dr. Josh Worch
Department of Chemistry
Virginia Tech

Dr. Wei Zhou
Bradley Dept. of Electrical & Computer Engineering
Virginia Tech

SAVE THE DATE!

35th Annual Blue Ridge Highlands Regional Science Fair

February 27 and 28, 2026



STUDY. DO. TEACH.

Join us for camp this summer

SUMMER CAMP 2025

Explore Science
Data Science to Solve Real World Problems
Explore Physical Science
Explore Life Science

TEACHER DEVELOPMENT WORKSHOP

Hands-on workshops to support grades 8-12 Science, Math, Statistics, and Computer Science Teachers.

LEARN MORE AND REGISTER

COLLEGE OF SCIENCE
VIRGINIA TECH

Senior Division Projects

ANIMAL SCIENCES

101 **Xavier Gitre**
Interspecific Social Networks of Parulidae Warblers in Active Migratory Passage
Blacksburg High School
Sponsor: Katharine Davis

102 **Becca Lowe**
Stand Still! A Comparison of Positive and Negative Reinforcement in Equine Training
Blacksburg High School
Sponsor: Katharine Davis

103 **Emily Paul**
The Effects of Heavy Metal Contaminants on Negative Phototropism Behaviors in Ephemeoptera Species
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

104 **Garrison Wheatley**
The Effect of Water Temperature on the Time that Peltodytes duodecimpunctatus Spends Under Water
Southwest Virginia Governor's School
Sponsor: Sherry Pugh

BEHAVIORAL AND SOCIAL SCIENCES

201 **Sydney Deane**
Impact of Alternative Marketing Strategies on the Perception of Shelter Animals
Blacksburg High School
Sponsor: Katharine Davis

202 **Casey Felts**
The Impact of Local Resource Awareness on Selection of Local Sources
Southwest Virginia Governor's School
Sponsor: Megan Arnold

203 **Ashley Layne**
Exploring the Relationships Between Household Income and Type of Pet Owned
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204 **Madilyn Marsden**
Correlation Study Among Students Who Attended Montgomery County Public Schools (MCPS) Early Childhood Education with Current Senior Class Statistics
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The Effects of the Enforcement of Antidiscriminatory Legislation on Prejudice
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The Correlation Between Milk Packaging Types and Human Perception of Quality and Price
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Does the Percentage of Industry Jargon in Meta Description Tags Have an Impact on Website Engagement Rate?
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Obstacles in New River Valley Extracurricular Participation
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English Place-Names and Viking Activity
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Gauging the Cultural Relevance of Bluegrass Lyrics to Central Appalachia via Linguistic Analysis
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The Correlation Between Nicotine Patch Usage to Episodic Future Thinking and Contingency Management within a Research Environment
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Lissajous Figures and Their Use in Tuning Musical Intervals
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214 **Olivia Vaught**
Demographic Analysis Between Private and Public School Options
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BIOMEDICAL AND HEALTH SCIENCES

301 **Jackson Pollyea**
The Effect of Sleep Quality on the Power Output of Youth Cyclists
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The Impact of Arm Position on Blood Pressure Measurements
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Morphological Changes to the Pelvic Floor Muscle Complex Before, During, and After Pregnancy in a Murine Model
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Sponsor: Katharine Davis

BIOMEDICAL ENGINEERING TRANSLATIONAL MEDICAL SCIENCE

401 **Athithi Prakash**
Novel Engineered Anticancer Biomaterial for Non-Invasive Melanoma Treatment
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Sponsor: Katharine Davis

402 **Weston Smith**
StepSense: Advancing Neuroprosthetic Solutions for Diabetic Peripheral Neuropathy
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Sponsor: Megan Arnold

CHEMISTRY

501 **Michael Duncan**
Determining Nitrogen Content in Soil Above Cemeteries Versus Normal Soil
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502 **Ruby Hoerter**
Concentrations of B-carotene in Fresh, Canned, and Frozen Carrots
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How Do New River Facilities Relate to Total Nitrogen Content in the New River?
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Determining the Accuracy of Chlorinity in Public Pools
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505 **Natalie Tessar**
Exploring the Relationship Between Metalloids and Tampon Absorbency Sizes
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COMPUTATIONAL BIOLOGY AND BIOINFORMATICS

601 **Connor Beasley**
Identification and Analysis of Fungal Ice Nucleic Candidate Proteins with Computational Biochemistry
Southwest Virginia Governor's School
Sponsor: Rebecca Phillips

602 **Rishi Nair**
AI-Augmented Computational Modeling of Bispecific Antibody Targeting B7H4+ Cancer Cells and CD3e+ CAR T-Cells for Targeted Therapy in Solid Tumors
Blacksburg High School
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603 **Thomas Payne**
Exploring Beta-Diversity Differences Between Natural and Artificial Lakes Using Metagenomic Analysis
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EARTH AND ENVIRONMENTAL SCIENCES

701 **Jarib Cruz**
The Effect of Varying Magnetic Field Intensities on the Solubility of Minerals
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702 **Vivian Fant**
Assessing Microplastic Contamination in Agricultural and Mountainous Streams of Grayson County
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The Relationship Between Heat and Income in Virginia: A Correlational Study
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Effectiveness of Water Treatment Processes
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Levels of Dissolved O2, pH, and Nitrate in Water
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706 **Alexandra Ni**
Temperature and Distance from Landfills on Methane and Carbon Dioxide Levels in Soil
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EMBEDDED SYSTEMS MATHEMATICS

801 **Austin Quesenberry**
Examining the Major Influences on Running Performance with a Focus on Fatigue
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802 **Kyle Stephens**
Change in Throwing Performance Throughout the History of the Olympics
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Creating a Template for P=NP
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ENERGY: SUSTAINABLE MATERIALS AND DESIGN PHYSICS AND ASTRONOMY

901 **Emma Biesterveld**
How Does Spin Rate Affect the Velocity of a Pitch and What is the Main Correlation Between Them?
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The Effect of Mass Distribution in a Rotating Mass Wave Energy Converter
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Is Dice Randomization Affected by Hand Shape?
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904 **Minh Nguyen**
Optimizing Meta-Atoms for Large Scale Metalenses
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906 **Ian Yu**
A Novel Approach to Martian Obstacle Detection Through Ultrasonic Transducers
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ENGINEERING TECHNOLOGY: STATICS AND DYNAMICS

1001 Quinlan Beegle
Developing High Friction Insoles to Reduce the Size and Frequency of Microslips in Sockless Track Athletes' Running Economy
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1002 Nyjah Da'Mes
Redesigning Infiniti's Sunrood Drain System
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1003 Ian Jora Macrea
Repeated Impacts on Cycleing Helmet Efficacy
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1004 Spencer Sisson
Sensor to Measure Tilt While Running
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1005 Amelia Sprano
Passive Solar Heater
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ENVIRONMENTAL ENGINEERING MICROBIOLOGY

1101 Sophia Chavez
Effect of High-Density Polyethylene Microplastics on Growth of Chlorella
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1102 Joshua Osemobor
Environmental Limiting Factors of the Plankton Paradox
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Investigating Microplastic Trapping Efficiency of Coral Reef Regrowth Structures in Simulated Ocean Currents in the Presence of Modeled Acropora cervicomis
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MATERIALS SCIENCE

1201 Swati Aggarwal
Testing Natural and Store-Bought Stain Removers on Different Color Cotton Fabric
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Evaluating the Durability of Writing Under Laboratory Conditions: A Comparative Study on Spills and Sunlight
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Reaction Times of Catching a Ground Ball on Various Ground Conditions
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Effects of Coatings on the Ultrasonic Testing of Welds on Structural Steel
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Aesthetic Properties of Alginate-Based Yarn and Its Commercial Counterparts
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PLANT SCIENCES

1301 Saige Carico
Flavobacterium capsulatum on Drought Tolerance in Pea Plants
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1302 Avi Gandhi
Testing if Liquid Ashwagandha Supplement Will Increase the Rate of Growth for Cilantro
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Symbiotic Strength: Evaluating Mycorrhizal & Nitrogen-Fixing Influences on Plant Fitness
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The Effect of Permethrin Compared to a Hot Pepper Solution as a Pesticide Against Crickets
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1305 Eleanor Steele
Effects of Biochar Soil Amendment of Pisam sativum Under Flood Conditions
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ROBOTICS AND INTELLIGENT MACHINES

1401 William Ballard
Drones and Golf Simulator Accuracy
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1402 Ingrid Jora Macrea
The Accuracy of an American Sign Language Recognition Deep Neural Network Under Healthcare Conditions
Blacksburg High School
Sponsor: Katharine Davis

Junior Division Projects

ANIMAL SCIENCES BIOCHEMISTRY

2101 Silas Phillips
Exploring Indicators of Cellular Respiration in Saccharomyces cerevisiae with Levulose, Dextrose, and Sucrose
Scott Memorial Middle School
Sponsor: Lucas Phillips

2102 Virginia Vandyke
Fat or Fluffy 2.0
Riverview Elementary/Middle School
Sponsor: Whitney Vandyke

BEHAVIORAL AND SOCIAL SCIENCES

2201 Arabella Barton and Leah Wilson
Memory Check
Council High School
Sponsor: Rita Breeding

2202 Katelynn Owens
Heartbeat
Council High School
Sponsor: Rita Breeding

CHEMISTRY

2301 Allie Compton
Oxidation
Council High School
Sponsor: Rita Breeding

2302 Brayden Fuller and Aiden Fuller
Melting Ice
Council Elementary & Middle School
Sponsor: Rita Breeding

2303 Anna Keene
Burn Baby Burn: Does Temperature Affect How Fast a Candle Burns?
Riverview Elementary/Middle School
Sponsor: Amanda Shelton

2304 Aden Lovingood
Lemontricity
Council Elementary & Middle School
Sponsor: Rita Breeding

2305 Xander Matney
What Melts Ice the Fastest?
Twin Valley Elementary/Middle School
Sponsor: Rebekah Romang

2306 Jacelyn Peak
Starlite Defense! The Fireproof Wonder!
Twin Valley High School
Sponsor: Nikki Peak

2307 **Mia Sanders**
Nuttin But Power
Twin Valley High School
Sponsor: Pamela Deel

EARTH AND ENVIRONMENTAL SCIENCE PHYSICS AND ASTRONOMY

2401 **Leela Bradbury-Swarup and Letian Zhou**
An Assessment of Flash Drought Variability and Index Concordance
Blacksburg Middle School
Sponsor: Samarth Swarup

2402 **Cooper Justice and Wyatt Street**
Explaining Physics Through Balloon Car Experiment
Riverview Elementary/Middle School
Sponsor: Amanda Shelton

2403 **Angela Lin**
Will It Sink or Will It Float
Riverview Elementary/Middle School
Sponsor: Amanda Shelton

2404 **Jonathan Lovingood**
Balloon in a Bottle
Council Elementary & Middle School
Sponsor: Rita Breeding

2405 **Lindsay Owens and Zoey McGlothlin**
Liquid Density
Council High School
Sponsor: Rita Breeding

MATERIALS SCIENCE

2501 **Mattie Christian**
Lights Out
Hurley Elementary/Middle School
Sponsor: Nathan Stacy

2502 **Aaron Hess**
Pitch Perfect
Homeschool
Sponsor: Danielle Hess

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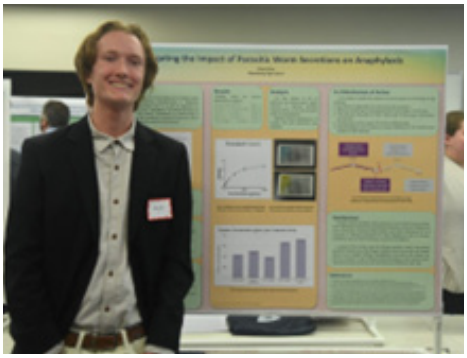

Grand Award Winner
Ethan Ririe
Investigating the Impact of Parasitic Worm Secretions on Anaphylaxis as Novel Treatment for Food Allergies
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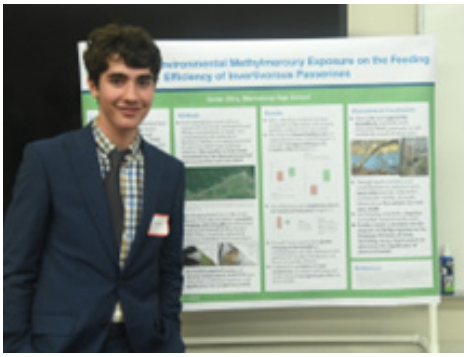
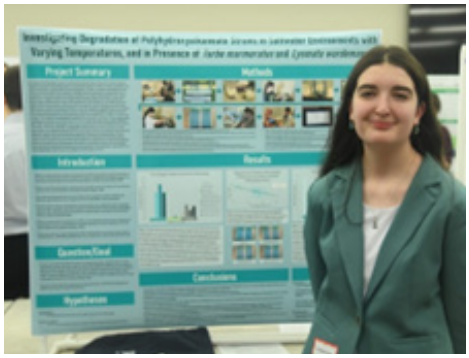


Grand Award Winner
Xavier Gitre
Organic Mercury and Avian Foraging: The Impact of Methylmercury Exposure on the Feeding Efficiency of Invertivorous Passerines
Blacksburg High School
Sponsor: Katharine Davis



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Charlotte Phillips
Investigating Degradation of Polyhydroxyalkanoate Straws in Saltwater Environments with Varying and Lysmata wurdemanni
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