

# 2025 CREST-Jane Goodall Science Symposium Award Winners

Hosted by Riverside High School

February 24 – 25, 2025

Keynote Speaker: Anneli Tostar, West Linn High School class of 2011

## Regional Awards Organizations

### Outstanding Research in Psychology

The Outstanding Research in Psychology award, sponsored by the American Psychological Association, awards a certificate recognizing outstanding research in the category of behavioral and social sciences or any category related to psychology.

Olivia Sheng, Avani Patel, Lauren Shin

*Quantifying Instant Gratification in High School Students Using Eye-Tracking and Questionnaire Data*

Zoe Knighten, Isabelle Cobb, Liliana Nishan

*What Does Doodling Do For Memory Recall?*

### Association of Women Geoscientists Award

The Award for Geoscience Excellence goes to the project which exemplifies a high standard of innovation and scientific excellence in the geosciences, and in which at least one team member is female.

Eloise Kausen

*Stormwater Filter*

Marina Vadnais

*Sheltering Coral Reefs from Sun-Induced Stress*

### NASA Earth System Science Award

The NASA Earth System Science Award Certificate is given to the projects that best demonstrate insight into Earth's interconnected systems. The projects incorporate studies of the different components of Earth systems, their interactions and their evolution over time.

Marina Vadnais

*Sheltering Coral Reefs from Sun-Induced Stress*

Kaelyn Jones, Finn Howell

*Greening the Garbage: How Bromoform could reduce landfill methane emissions*

## NOAA Taking the Pulse of the Planet Award

The Taking the Pulse of the Planet award honors projects selected from among all the general award categories whose research emphasizes NOAA's mission of Science, Service, and Stewardship: "To understand and predict changes in climate, weather, oceans, and coasts, to share that knowledge and information with others, and to conserve and manage coastal and marine ecosystems and resources."

Ava Milanovich

*Ocean Motion to Energy*

Rubi Martin

*Dual Stressors: Investigating the Impact of pH and Sound Waves on the Growth Rate of Tetraselmis*

## Naval Excellence in Science and Engineering Award

The Naval Science and Engineering Award recognizes 4 exceptional projects. The Office of Naval Research is pleased to support the education of future scientists and engineers of America and presents each project with a \$50 gift certificate.

Elliott Frempong

*Reinventing the Vision Test: Maritime Worker's Color Vision Test*

Oliver Uelmen

*Determining Bamboo culm density for effective sound pollution mitigation*

Sai Nithya Kalavai

*Developing a Zero Gravity IV Drop: Designing an Innovative IV Drip Solution to Overcome Fluid Transfer Challenges in Zero-Gravity Environments*

Bryce Davis

*How are Programming Languages Created?*

## Outstanding Science or Engineering Fair Project from the US Air Force

The US Air Force Research Laboratory is proud to support science, technology, engineering, and mathematics. This certificate is awarded to five projects with Air Force applicability in science and technology. Winners will receive a certificate and some US Air Force swag including a sling pack, Power Bank, USB Flash Memory Drive, USB Car Charger, and Official Air Force Certificate.

Jaxx Phillips

*Microbial Viability in Plastic Reusable Bags Compared to Cotton Reusable Bags*

Timothy Lee

*Detour Ahead: Smart Fish Protection for Hydropower Dams*

Jorge Rumayor Gonzalez

*How extreme temperatures affect Space Solar Satellites signal strengt*

Lucy Becklin

*Snowstorm Disaster Relief Vehicle*

### Ricoh Sustainable Development Award

The Ricoh USA Certificate recognizes projects that demonstrate a technical innovation that offer great potential for increasing our ability to grow environmentally friendly and socially responsible businesses. This award comes with a certificate of congratulations.

Hayden Martuscelli, Evan Doms

*Influence of Soil Depth on Mycelium Inoculation*

Sydney Taylor

*Reimagining "Reef-Safe" - The use of Microsporine-like Amino Acids*

### Stockholm

The Stockholm Junior Water Prize, sponsored by the Water Environment Federation, is awarded to the best water-related projects at the fair. These projects are aimed at enhancing the quality of life through improvement in water quality, water resource management, or water and wastewater treatment. The recipients of this award get a certificate, a free year-long membership to the WEF, and the opportunity to apply to the state level WEF competition.

Eloise Kausen

*Stormwater Filter*

### In Vitro Biology

This award recognizes an 11th grade student project in the areas of plant or animal in vitro biology or tissue culture. A formal letter of congratulations will be sent to the winner, and publicity of the winners' achievement will be included in the society's online newsletter.

Brooklyn Carr Heuer

*Counteracting the Negative Impact of Antibiotics on the Microbiome*

Isla Granger

*RIRE-like effect in UV sensitive yeast when paired with healthy cells*

### USAID

The US Agency for International Development is pleased to offer two Science Champion Award Certificates which recognize two exceptional projects that have the potential to make an impact on addressing international development challenges.

Grace Haack

*Home Remedies vs. Staph E. A study of natural remedies against Staphylococcus epidermidis*

Neve Del Carlo, Katie Crim

*Development of Biodegradable Packaging from Natural Polymers to Reduce Plastic Waste*

### Metric System: Best Use of the SI

The Best Use of the Metric System award, sponsored by the US Metric Association, is a certificate to recognize the project that has used metric measures and expresses those measures consistently and correctly.

Shubhi Kumar

*Inhibition of Fusarium using Yeast*

Will Lively

*Escherichia Coli Adaptation to Increased Kanamycin Concentrations*

### Yale Science and Engineering Association

The Yale Science and Engineering Association sponsors an award which goes to the best 11th grade project in science, engineering, technology, and/or mathematics. This award comes with a certificate and a medallion.

Sahara Leeser

*Impedance Characterization of Undoped and Graphene-Doped Nanostructural ZnO Sensors Under Varying O<sub>2</sub> Concentrations*

## CREST Special Awards

### Best Project Display

The Best Project Display award goes to two exceptional displays which drew the judges in and were organized and comprehensive. A \$25 prize, provided by generous anonymous donors, and a certificate are awarded to one exceptional analog board and one exceptional digital board.

Nicole Norman, Viktoria Norman

*Bugs on a Buzz*

Romi Rozenhaimer

*African Wild Dog Fur Patterns and Their Correlation With Their Degree of Relatedness*

### Noteworthy Logbook

This award goes to the project who utilized their logbook in a meaningful way. Their logbook documented their thought process through all phases of the project, used notes, research, sketches, data, and more, and kept track of experimentation and results in an organized way. This award comes with \$25 and a certificate, thanks to support from anonymous community donors!

Lily Vu

*Variable Concentrations of an Ammonia-Based Fertilizer on Microgreens*

### Green Chemistry Award

The Green Chemistry award recognizes a project that has addressed the area of sustainable chemistry with emphasis on reducing chemical waste or remediating hazardous substances. The winner will receive \$25 and a certificate, made possible by an anonymous community donor!

Neve Del Carlo, Katie Crim

*Development of Biodegradable Packaging from Natural Polymers to Reduce Plastic Waste*

### Promising Young Scientist

This award goes to the 9th grade students who presented thoughtful, well-conducted experiments that show promise of greater things to come. Each project that receives this award wins \$25, made possible thanks to generous support from community members.

Rakhee Braunstein, Adelyn Pixton

*Phenology and how it affect our local trees*

Ella Candrian

*Turning Plant Debris into Paper to Reduce Deforestation*

Brianna Chen

*Glutamate-Induced Behavioral Changes in *Drosophila melanogaster*: A Model for Human Neuropsychiatric Disorders*

Jacqueline Esqueda

*The Effects People's Peers Have On Their Academic Performance*

Jakub Goll

*Project Magnetohydrodynamic Drive*

Nathaniel Dixon

*The Effect of Iron Content on the Specific Heat Capacity of a "Sand Battery"*

Ananya Ilanchelian

*The Impact of Heat Stress on Olfactory Function in *Vanessa Cardui* Butterflies*

Chassa Watkins, Eleanor Hydes, Alex Glynn

*Wormholes*

Andrii Vasylenko

*A Low-Compute ARC-AGI Algorithm*

### Field Knowledge

This award goes to the students who indicate the best understanding of their topic and who related their work to other research in the field. This award comes with a \$25 prize provided by an anonymous community partner!

Sara Henry

*The Effects of miR28, miR148a, and miR152 Knockout in EBV+ B-cells*

## Experimental Design

A certificate and a \$25 prize, provided by a generous anonymous community donor, goes to the project which demonstrates the best practices of experimental design.

**Delilah Leusch, Maryam Al-Medyadi**

*Genetic Mosaicism in Diamond-BlackFan Anemia: Navigating the Growth Impacts of Different Ratios of Healthy and DBA-like Cells*

## Most Creative Project Idea

The Most Creative Project award goes to a project that takes a unique approach to solve a scientific or technical problem, makes use of readily available materials to collect data or address a need, and demonstrates originality of thought. This award comes with a \$25 cash prize provided by an anonymous community partner!

**Cayden Whisman**

*An approach to Recycle & Repurpose 3D Filament Scrap at WHS*

## Intelligent Machines

The Intelligent Machines award recognizes a student who visually and verbally convey how their project, involving intelligent machines or artificial intelligence, will improve the human experience. This award comes with a \$50 prize, provided by an anonymous community partner!

**Aarush Palve**

*Predicting Wildfires with Machine Learning*

## Educator's Award

The Educator Award is awarded to the project which aimed to help students, teachers, schools, or other educational entities improve or investigate some aspect of the school experience. This award comes with a certificate and \$25, thanks to anonymous community partners!

**Cadence Cox**

*The Mint Myth*

## Technology in Medicine Award

This award goes to the project which used a multidisciplinary approach to solving a medical problem that involves the use of circuits, computer science, prostheses, or assistive technology. This award comes with a certificate and a \$25 prize, thanks to our generous anonymous community partners.

**Beatrice Gilfix, Henry Felsted**

*Affordable Assistive Prosthetics for Finger Mobility*

## Ethical Medical Model Award

The Ethical Medical Model award goes to a project which focused on the ethical selection and use of non-human models for medicine, in the fields of environmental health, environmental chemistry and toxicology, pharmacological development and evaluation, and food and water protection. This award comes with a certificate and a \$25 prize, made possible by our generous anonymous community partners.

Finley Springer

*Can lavender and sandalwood reduce heart rate of daphnia?*

### Paul Sherman Award

This award commemorates Paul Sherman, whom we lost to cancer in 2005. During his 24-year career at West Linn High School, he started both the Advanced Biology class and the boys' varsity soccer program. Although Paul felt he was not a natural teacher, his effort and creativity and driving, sustaining enthusiasm for science fooled them all. Paul was an honored teacher but that meant much less to him than sharing his love of learning with his students. He was known for doing special extra things like dressing up as various famous scientists who came and delivered "guest" lectures (and staying in character all day!), telling a joke of the day, leaping around the classroom demonstrating molecular action, and also always urging his students to have family time. The students who receive the Paul Sherman award Student exhibit passion and enthusiasm for their project and scientific and/or engineering research. The winners receive a \$25 gift card to Powell's Books.

Two Ortez

*Addicted To The Scroll: The Effect Of Social Media On The Adolescent Brain*

Audrey Reiner

*Fighting Acne: A Study on the Effectiveness of Treatment Products*

Paetyn Rector

*A Silent Solution: Designing an Environmental Monitoring System for Deaf Individuals*

Gabi Rutherford

*Bird Species Richness Along the Willamette River*

### Best Use of Statistical Analysis

The Best Use of Statistical Analysis Award recognizes five projects which conveyed an exceptional understanding and interpretation of the results of their statistical analyses. four projects who receive this certificate also receive a free, four-year subscription to the online TI-84 Graphing calculator. The top prize wins a free, rechargeable graphing calculator. These were generously donated by Texas Instruments!

Annamika Konkola

*Eusocial Intelligence: Ant Social Immunity Behavior as a Model for Pandemic Response*

Julia Tatsumi

*COVID 19: The Sensory Thief*

Lilian Tatsumi

*COVID 19: The Sensory Thief*

Noor Alfar

*Analyzing zones of inhibition from Lavender, Rosemary, and Oregano on Corynebacterium xerosis*

Olivia Sheng, Avani Patel, Lauren Shin

*Quantifying Instant Gratification in High School Students Using Eye-Tracking and Questionnaire Data*

## Extra Special Awards

### Best Multi-Disciplinary Research Award

The Best Multi-Disciplinary Research Award is given to a project that demonstrates outstanding achievement combining 2 or more distinct scientific/engineering disciplines, synthesizing these different perspectives to provide a more whole-system approach to a problem. The project that receives this award wins a certificate and a \$125 prize, thanks to an anonymous community member.

Annamika Konkola

*Eusocial Intelligence: Ant Social Immunity Behavior as a Model for Pandemic Response*

### Women in Engineering Award

The Women in Engineering Award is given to a project that demonstrates excellence in applied engineering in any field by a female student. This award comes with a certificate and a \$125 prize – we'd like to extend special thanks to the anonymous community partners who made this possible!

Anvi Singh

*Advancing Opioid Overdose Intervention: Formulating Novel Spray-Dried Naloxone Microparticles for Pulmonary Delivery*

### Regeneron Biomedical Science Award

This project, from within the biomedical and health sciences, exemplifies The Regeneron Way. The Regeneron way says, "Lead with science, take on big ideas, make it happen, be great together, and do what's right." This award comes with a certificate and a \$375 prize.

Francisca Brevis

*Rising Thermometers, Rising Threats: How Temperature Affects Influenza Dynamics*

### Oregon State University (\$2000, one time)

The Oregon State University scholarship is a one-time \$2,000 general scholarship awarded to two exceptional projects in any category.

Ava Brill

*Harnessing Adaptive Resilience of Symbiotic Zooxanthellae: Enhancing Tolerance to Ocean Acidification and Diuron in Coral Ecosystems, with Future Potential for Genetic Optimization and Directed Evolution*

Paige Jackson

*Using Weeds with Rhizobium Fungi to Rehabilitate Poor Soil with Composted Nutrients*

## BorgWarner - Best Execution of the Design Process

This award recognizes the best execution of the design process as determined by local engineers at the firm BorgWarner PDS Portland and they specifically wanted to honor a spectacular student who worked in the field of Energy and Environmental Engineering and one in the field of Electrical and Mechanical Engineering.

Natalie Olson

*An "Extra Hand": Portable Robotic Hand on Wheels*

Duncan Duffield

*Revolutionizing Energy: Advancing Energy Storage with Graphene*

# Category Awards

## Behavioral and Social Sciences

### First Place

Olivia Sheng, Avani Patel, Lauren Shin

*Quantifying Instant Gratification in High School Students Using Eye-Tracking and Questionnaire Data*

### Second Place

Arwen Mencke, Clara Wood, Kiera Kuehn

*Multitasking: Brain Drain or Brain Boost?*

### Third Place

Abbie Wu, Georgia Santoso

*How Does Gamification Affect Teenagers' Risk Taking Tendencies*

### Honorable Mention

Garrett Boreham-Doyle

*What Do Adults Think About Genetically Modified Foods?*

Helena Vadnais

*Does 'More' Representation Equal 'Good' Representation?: A Content Analysis of LGBTQ+ Characters In Hollywood Films, 2010 to 2024*

## Bioengineering & Materials Science

### First Place

Anvi Singh

*Advancing Opioid Overdose Intervention: Formulating Novel Spray-Dried Naloxone Microparticles for Pulmonary Delivery*

## Second Place

Suhaani Garg

*AAVehicle: Novel Adeno-Associated Virus via AAP Domain Shuffling for Enhanced Capsid Formation and Gene Therapy as Treatment for Genetic Disorders*

## Third Place

Megan Whitt, Mia Williams

*Biomimetic Hydrogel Heart Valve: Engineering a Novel Solution to Combat Infective Endocarditis*

## Honorable Mention

Sahara Leeser

*Impedance Characterization of Undoped and Graphene-Doped Nanostructural ZnO Sensors Under Varying O<sub>2</sub> Concentrations*

## Computer Sciences & Robotics

### First Place

Arush Goswami

*De Novo Protein Design for Enhanced Energy Capture in Biohybrid Solar Cells*

### Second Place

Anshu Mukherjee

*ML-Based Decision Support Tool to Reduce Diagnostic Delay in IBD Using Exposomic Risk Factors*

### Third Place

Sujan Shadrak

*Leveraging AI for Early Detection and Diagnosis of Anxiety and Depression*

## Honorable Mention

Sabrina Zhang

*Type 2 Diabetes and Accelerated Cellular Aging: A Mechanistic Approach to Mortality Risk Prediction*

## Electrical and Mechanical Engineering

### First Place

Liam Ottum, Sai Kalavai

*Developing an Integrated DNA Data Storage System Utilizing Hybrid Plant Sequencing and Microcontroller-Driven Nucleotide Decoding*

### Second Place

Siddharth Sundaram

*Constructing a Variable Stiffness Magnetic Spring System*

### Third Place

Sai Nithya Kalavai

*Developing a Zero Gravity IV Drop: Designing an Innovative IV Drip Solution to Overcome Fluid Transfer Challenges in Zero-Gravity Environments*

### Honorable Mention

Callen Molander

*The Never Fail Alarm Clock*

## Energy & Environmental Engineering

### First Place

Aasha Patel

*Bright Solutions: Cost-Optimized Photobioreactor for Sustainable Agriculture and Laboratory Applications*

### Second Place

Lily Vu

*Variable Concentrations of an Ammonia-Based Fertilizer on Microgreens*

### Third Place

Addison Arakelian

*Carbon Dioxide Sequestering Microalgae Biochamber- Chlorophyll a Analysis*

### Honorable Mention

Duncan Duffield

*Revolutionizing Energy: Advancing Energy Storage with Graphene*

## Environmental and Earth Sciences

### First Place

Niyati Bhaskar

*A Balancing Act of Bacteria and Blooms*

### Second Place

Kaelyn Jones, Finn Howell

*Greening the Garbage: How Bromoform could reduce landfill methane emissions*

### Third Place

Ava Brill

*Harnessing Adaptive Resilience of Symbiotic Zooxanthellae: Enhancing Tolerance to Ocean Acidification and Diuron in Coral Ecosystems, with Future Potential for Genetic Optimization and Directed Evolution*

## Honorable Mention

Riley Swakon

*Regenerative Farming and Soil Carbon: The Keys to Restoring The American Agriculture System*

## Microbiology

First Place

Zachary Santoso

*Identifying Mediterranean Oak Borer using Novel Convolutional Neural Network Fungi Classification*

Second Place

Brooklyn Carr Heuer

*Counteracting the Negative Impact of Antibiotics on the Microbiome*

Third Place

Sara Henry

*The Effects of miR28, miR148a, and miR152 Knockout in EBV+ B-cells*

## Honorable Mention

Kendrick Wong

*Exploring Natural Solutions: Garlic, Onion, and Honey as Potential Replacements for Nephrotoxic Antibiotics in Bone Grafts.*

Shubhi Kumar

*Inhibition of Fusarium using Yeast*

## Life Sciences

First Place

Sydney Taylor

*Reimagining "Reef-Safe" - The use of Microsporine-like Amino Acids*

Second Place

Annamika Konkola

*Eusocial Intelligence: Ant Social Immunity Behavior as a Model for Pandemic Response*

Third Place

Paige Jackson

*Using Weeds with Rhizobium Fungi to Rehabilitate Poor Soil with Composted Nutrients*

## Honorable Mention

Val Bonner

*Determining the significance of color to male fruit flies*

## Medicine and Health Sciences

### First Place

Delilah Leusch, Maryam Al-Medyadi

*Genetic Mosaicism in Diamond-BlackFan Anemia: Navigating the Growth Impacts of Different Ratios of Healthy and DBA-like Cells*

### Second Place

Fiona Jarneberg

*Planarian Worms & the Optic Nerve*

### Third Place

Henry Weisensee

*Cardio-Regenesis*

Elliana Siegel-Kittrell, Kesavi Rossington

*How melatonin supplementation effects the natural production of melatonin*

### Honorable Mention

Maggie Weber

*Could Your Shampoo Be Causing Hair Damage?*

Matthew Tence

*The influence of Immersion Duration and Tissue Type on Optical Tissue Transparency Induced by Tartrazine*

## Physics and Astronomy

### First Place

Annika Martin

*Quantifying AGN Feedback in High-Redshift Quasars: A Multi-Wavelength Spectroscopic Approach to Outflow Kinematics*

### Second Place

Lauren Gault, Ruby Deng

*The Future of Trapped Ion Quantum Computing*

### Third Place

Theo Johnson

*A Rediscovery of Umbral Calculus*

## Honorable Mention

Maizy Benston, Morgan Farnand, Percy Pritchard

*Perception of Theories on the Cold Spot*

# Advancing to the Northwest Science Expo

The top 30% of projects from our science have been selected to advance to the state-level science fair. This event will take place on April 11, 2025 at Portland State University.

Olivia Sheng, Avani Patel, Lauren Shin	Duncan Duffield Niyati Bhaskar	Annika Martin Lauren Gault, Ruby Deng
Arwen Mencke, Clara Wood, Kiera Kuehn	Kaelyn Jones, Finn Howell Ava Brill	Eloise Kausen Marina Vadnais
Anvi Singh Suhaani Garg	Riley Swakon Zachary Santoso	Grace Haack Aarush Palve
Megan Whitt, Mia Williams Sahara Leeser	Brooklyn Carr Heuer Sara Henry	Paetyn Rector Julia Tatsumi, Lilian Tatsumi
Arush Goswami Anshu Mukherjee	Kendrick Wong Shubhi Kumar	Noor Alfar Abbie Wu, Georgia Santoso
Sujan Shadrak Sabrina Zhang	Sydney Taylor Annamika Konkola	Garrett Boreham-Doyle Helena Vadnais
Liam Ottum, Sai Kalavai Siddharth Sundaram	Paige Jackson Delilah Leusch, Maryam Al- Medyadi	William (Val) Bonner Francisca Brevis
Sai Nithya Kalavai Callen Molander	Fiona Jarneberg Henry Weisensee	Maggie Weber Matthew Tence
Aasha Patel Lily Vu	Elliana Siegel-Kittrell, Kesavi Rossington	Gabi Rutherford Romi Rozenhaimer
Addison Arakelian		

# Advancing to the Regeneron International Science and Engineering Fair

Representing the West Linn-Wilsonville School District on the International Stage, to compete with 1,500 students from more than 80 countries, these four projects represent the best of Fair. ISEF will take place May 11-16, 2025 in Columbus, Ohio

Arush Goswami

*De Novo Protein Design for Enhanced Energy Capture in Biohybrid Solar Cells*

Annika Martin

*Quantifying AGN Feedback in High-Redshift Quasars: A Multi-Wavelength Spectroscopic Approach to Outflow Kinematics*

Suhaani Garg

*AAVehicle: Novel Adeno-Associated Virus via AAP Domain Shuffling for Enhanced Capsid Formation and Gene Therapy as Treatment for Genetic Disorders*

Anvi Singh

*Advancing Opioid Overdose Intervention: Formulating Novel Spray-Dried Naloxone Microparticles for Pulmonary Delivery*