

2024 CREST-Jane Goodall Science Symposium

Hosted by West Linn High School

March 11, 2024 – March 12, 2024

Keynote Speaker: Dr. Sabrina Levy Maoz, West Linn High School Class of 2011, "Memory Encoding in Human Brain Waves: Insights From Deep Brain Recordings During Virtual Reality and Real-World Navigation"

Regional and CREST Special Awards

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.

Fiona Jarneberg, Riverside High School

How to Stay Out of Prison

Ruthie Murphy, Riverside High School

The Parenting Tree

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.

Paige Jackson, Riverside High School

Using Natural Root Mechanics to Replenish Poor Soil with Composted Fertilizer

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.

Cassidy Young, Sophia Levesque, Wilsonville High School

What is the relationship between atmospheric nitrogen and the presence of lichen in a high-use recreational park in Oregon

Michael Galler, Romeo Daly, Merritt Rotkowski, West Linn High School

Creeping Consequences: Unraveling the Impact of Pesticides on Earth's Soil Stewards – Worms

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 Brill, West Linn High School

Exploring the Impact of Marine Plants on Brine Shrimp Resilience in Acidified Ocean Environments: A Comparative Study

Chloe An, Charlie An, West Linn High School

How the Acidification of Water Affects Survival Rates in Ciliates, and How it Connects with Future Aquatic Ecosystem Health

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.

Ella Kerner, West Linn High School

Building a Resilient Fire Shield for Our Furry Friends

Ronak Sameer-Asita, Wilsonville High School

Estimate Information Content of Properties of Elliptic Curves

Arush Goswami, Wilsonville High School

Development of a Novel Low-Cost Hand Exoskeleton Device to Improve Stroke Rehabilitation Using Brain-Computer Interface

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.

Liam Ottum, Suhaan Shettigar, Wilsonville High School

Developing an Environmentally Sustainable Flow Battery Utilizing Organic Compounds: Integrating Hydrated Polymer Salt Electrolytes and Bio-Mass Derived Electrodes.

Rowan Sechrist, Jacob Kemp, West Linn High School

Are Burnt Trees From Forest Fires the Key to Limiting Deforestation?

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.

Karen Chan, Allison Wong, West Linn High School

Light color and fruit fly photosensitivity

Katerina Kitsis, West Linn High School

The Effects of Temperature on Antibiotic Resistance Transfer

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.

Meri Hunanyan, West Linn High School

Dye Sensitized Solar Cells

USAID

Manal Faisel, Wilsonville High School

COVID-19 Pandemic Simulations

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.

Kate Kurata, Wilsonville High School

Denaturing of the Enzyme Papain

Anna Nurmi, Grace James, Isla Granger, West Linn High School

How Stimulants and Depressants Affect Bacterial Growth

US Air Force

The US Air Force Research Laboratory is proud to support science, technology, engineering, and mathematics. This certificate is awarded to three projects with Air Force applicability in science and technology. Winners will receive a certificate and some US Air Force swag.

Paul Liu, Sujun Shadrak, Wilsonville High School

Detection/Monitoring Wildfires with a UAV-Collected RGB/IR Dataset and Multi-agent motion planning algorithm for human-like navigation in dynamic environments using Cognitive Hierarchy & Q-Learning

Chase Crouch, Wilsonville High School

It's Electric! Capturing Excess Heat from Hydrogen-Electric Airplane Engines

Cayden Whisman, Jake Schreiber, Wilsonville High School

The Engineering Marvels of T-Shirt Launchers

Amaya Martinez, Jack Johnston, West Linn High School

MEA Car Attachment

Paetyn Rector, West Linn High School

Testing the effect of Gua Sha therapy as a home remedy on tinnitus

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.

Grayson Zhang, Sabrina Zhang, West Linn High School

Low-Cost, 3D-Printed, Universal-Fit, Bioprosthetic Heart Valve for Patients in Developing Countries

Best Project Display - Analog

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.

Ruthie Murphy, Riverside High School

The Parenting Tree

Best Project Display - Digital

Paul Liu, Sujun Shadrak, Wilsonville High School

Detection/Monitoring Wildfires with a UAV-Collected RGB/IR Dataset and Multi-agent motion planning algorithm for human-like navigation in dynamic environments using Cognitive Hierarchy & Q-Learning

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!

Annamika Konkola, West Linn High School

Beyond the Classroom: Tracing Justice in Education Through Student Discipline and School Climate

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!

Liam Ottum, Suhaan Shettigar, Wilsonville High School

Developing an Environmentally Sustainable Flow Battery Utilizing Organic Compounds: Integrating Hydrated Polymer Salt Electrolytes and Bio-Mass Derived Electrodes.

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.

Ellis Highland, Emma Arakelian, West Linn High School

Breathing Spaces: A Study on all the Surrounding Elements Impacts on Air Quality During Dismissal at West Linn High School

Olivia Sheng, West Linn High School

Exploring the Impact of Aspergillus niger on Polypropylene Degradation

Elliana Siegel-Kittrell, West Linn High School

How does collagen affect the cell morphology of caenorhabditis elegans?

Kiera Kuehn, West Linn High School

Music & Creativity

Maddux Rector, West Linn High School

Sprag Clutch Redesign

Brayden Wassom, Wilsonville High School

Solar Cars

Zoe Anderson, West Linn High School

The Influence of Environmental Sounds on Mushroom-based Oil Remediation

Matilda Laurer, Riverside High School

The Expression of Dark Energy within Galaxy Clusters

Sean Coyne, Cyrus Blackford, West Linn High School

AI Pen That Interprets & Processes Text

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!

Zachary Santoso, West Linn High School

Phosphoric Acid in Combating the Spread of F. Oxysporum and Xyleborus Monographus

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.

Niyati Bhaskar, Wilsonville High School

Rising from the Rhizosphere

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!

Grace Haack, Wilsonville High School

Snails vs Staph E.

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!

Madeline Santoso, Kaya Hald, West Linn High School

A Natural Language Processing Approach for Biodegradable Chemical Analysis

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!

Clara Wood, Arwen Mencke, West Linn High School

ELLs in a Local Suburban District Compared to other Oregon School Districts.

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.

Anvi Singh, Shubhi Kumar, Wilsonville High School

The Impact of EMF Exposure on Cell Regeneration

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.

Katelynn Wesse, Wilsonville High School

Effect of Electrical Stimulation on Peripheral Nerve Damage in Lumbricus Terrestris Caused by Lidocaine

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.

Eloise Kausen, West Linn High School

Sustainable Space Heater

Zarek Ferguson, Wilsonville High School

Smoke In A Cloud Chamber (S.I.A.C.C.) Experiment

Avani Patel, Wilsonville High School

Attacking Alzheimer's: Decreasing Protein Accumulation in the Drosophila melanogaster Brain via Panax quinquefolius (American Ginseng) Derived Dietary Supplement.

Michael Candrian, Wilsonville High School

Old Puzzle, New Innovations

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!

Aasha Patel, Wilsonville High School

Sustainable Spirulina: Lysed Arthrospira platensis Phycocyanin-rich Biofertilizer (APB) for DWC Hydroponic Applications

Sydney Taylor, West Linn High School

"Reef Safe" Sunscreen - The Impact of Zinc Oxide Particle Size on Chlorophyll A and B Zooxanthellae

Catherine Betty, Avery Azsmus, West Linn High School

What Difference does the Britta Filter Really Make?

Niyati Bhaskar, Wilsonville High School

Rising from the Rhizosphere

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.

John D'Souza, Wilsonville High School

AI basketball referee ~ Out of Bounds Call

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!

Suhaani Garg, West Linn High School

TNBCnano: Novel LBL Nanoparticles for Systemic Combination Delivery of siRNA and Doxorubicin as a Triple-Negative Breast Cancer Treatment

Best Execution of the Design Process in the category of Energy and Environmental Engineering

This award recognizes the best execution of the design process as determined by local engineers at the 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.

Sahara Leeser, West Linn High School

Matcha's Antioxidant-Mediated Chlorine Neutralization In Water Treatment

Arush Goswami, Wilsonville High School

Development of a Novel Low-Cost Hand Exoskeleton Device to Improve Stroke Rehabilitation Using Brain-Computer Interface

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.

Delilah Leusch, Maryam Al-medyadi, West Linn High School

The Female Brain: Navigating Generational Impacts of Female Parent Traumatic Brain Injury

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.

Aasha Patel, Wilsonville High School

Sustainable Spirulina: Lysed Arthrospira platensis Phycocyanin-rich Biofertilizer (APB) for DWC Hydroponic Applications

Annika Martin, Wilsonville High School

WaveWise: Machine Learning Analysis of Neutron Star Merger Gravitational Wave Signals to Refine Equation of State Parameters

Category Awards

Behavioral and Social Sciences

First Place

Annamika Konkola, West Linn High School

Beyond the Classroom: Tracing Justice in Education Through Student Discipline and School Climate

Second Place

Grace Boyer, Lily Walsh, West Linn High School

ChatGPT in the High School Setting

Third Place

Noah Donegan, Kaleb Grunwald, Wilsonville High School

Visual Dynamic Textures

Honorable Mention

Sandy Tang, Elisa Yu, West Linn High School

Does White Noise Help Athletes

Bioengineering and Materials Science

First Place

Suhaani Garg, West Linn High School

TNBCnano: Novel LBL Nanoparticles for Systemic Combination Delivery of siRNA and Doxorubicin as a Triple-Negative Breast Cancer Treatment

Second Place

Kate Kurata, Wilsonville High School

Denaturing of the Enzyme Papain

Third Place

Grayson Zhang, Sabrina Zhang, West Linn High School

Low-Cost, 3D-Printed, Universal-Fit, Bioprosthetic Heart Valve for Patients in Developing Countries

Third Place

Claire Sousley, West Linn High School

Optimizing Planaria Habitat: Investigating the Impact of 3D-Printed Filaments on Growth and Behavior in Relation to Stem Cells

Honorable Mention

Sai Kalavai, Aarush Palve, Wilsonville High School

Exploring artificial intelligence incorporation in prosthetic limbs: Revolutionizing Limb Replacement with AI-Enhanced Brain Control and Adaptive Haptic Feedback

Computer Sciences and Robotics

First Place

Madeline Santoso, Kaya Hald, West Linn High School

A Natural Language Processing Approach for Biodegradable Chemical Analysis

Second Place

Anshu Mukherjee, West Linn High School

Symptomatic IBD Patient Identification Using Clinical and Simulated Wearable Device Data

Third Place

Paul Liu, Sujan Shadrak, Wilsonville High School

Detection/Monitoring Wildfires with a UAV-Collected RGB/IR Dataset and Multi-agent motion planning algorithm for human-like navigation in dynamic environments using Cognitive Hierarchy & Q-Learning

Honorable Mention

Kevin Lin, West Linn High School

AI Music Teacher

Electrical and Mechanical Engineering Place

Arush Goswami, Wilsonville High School

Development of a Novel Low-Cost Hand Exoskeleton Device to Improve Stroke Rehabilitation Using Brain-Computer Interface

Second Place

Chase Crouch, Wilsonville High School

It's Electric! Capturing Excess Heat from Hydrogen-Electric Airplane Engines

Third Place

Alex Duval, Wilsonville High School

Velocity Vortex: Beyblade Revival

Honorable Mention

Chiara Arendt, West Linn High School

Painless Precision: A New Look to Pediatric IVs with Infrared and Ultrasound Innovation

Energy and Environmental Engineering

First Place

Aasha Patel, Wilsonville High School

Sustainable Spirulina: Lysed Arthrospira platensis Phycocyanin-rich Biofertilizer (APB) for DWC Hydroponic Applications

Second Place

Liam Ottum, Suhaan Shettigar, Wilsonville High School

Developing an Environmentally Sustainable Flow Battery Utilizing Organic Compounds: Integrating Hydrated Polymer Salt Electrolytes and Bio-Mass Derived Electrodes.

Third Place

Addison Arakelian, Wilsonville High School

Carbon Dioxide Sequestering Microalgae Biochamber

Honorable Mention

Rowan Sechrist, Jacob Kemp, West Linn High School

Are Burnt Trees From Forest Fires the Key to Limiting Deforestation?

Earth and Environmental Sciences

First Place

Sydney Taylor, West Linn High School

"Reef Safe" Sunscreen - The Impact of Zinc Oxide Particle Size on Chlorophyll A and B Zooxanthellae

Second Place

Rubi Martin, Wilsonville High School

Intertidal Troubles: How Tourism is Affecting Blue Mussels on the Oregon Coast

Third Place

Lucas Sobotta, West Linn High School

The Impact of Decomposing Leaf Mulches on Soil Moisture Retention and Plant Resilience of Early Girl Tomatoes under Dryland Agriculture

Honorable Mention

Francisca Brevis, West Linn High School

Observing the unseen: Microplastics in the Willamette River

Microbiology

First Place

Megan Whitt, Wilsonville High School

Bioinspired Materials to Reduce Infective Endocarditis in Artificial Heart Valves

Second Place

Niyati Bhaskar, Wilsonville High School

Rising from the Rhizosphere

Third Place

Zachary Santoso, West Linn High School

Phosphoric Acid in Combating the Spread of F. Oxysporum and Xyleborus Monographus

Honorable Mention

Kiera Taylor, West Linn High School

Bacteriophage Replication Durability

Life Sciences

First Place

Abbie Jalili, Vanessa Partida, Samuel Koehler, West Linn High School

The effect consumption of Tardigrade Disordered Protein has on Danio Activity

Second Place

Sarah Sanborn, Colin Bowyer, West Linn High School

The Effects of Longer Intersession Latency on Skill Acquisition and Performance in Diverse Populations of Canis lupus familiaris

Third Place

Paige Jackson, Riverside High School

Using Natural Root Mechanics to Replenish Poor Soil with Composted Fertilizer

Honorable Mention

Ava Brill, West Linn High School

Exploring the Impact of Marine Plants on Brine Shrimp Resilience in Acidified Ocean Environments: A Comparative Study

Medicine and Health Sciences

First Place

Delilah Leusch, Maryam Al-medyadi, West Linn High School

The Female Brain: Navigating Generational Impacts of Female Parent Traumatic Brain Injury

Second Place

Jack Benninger, West Linn High School

Novel GAX-Specimens with ilnovative BriteVu Contrast Delivers Lifelike POCUS Sonoanatomy Procedures.

Third Place

Isabella Buzzelli, West Linn High School

The Effect of Sodium Benzoate on the Morphology of Drosophila Gut

Honorable Mention

Ashton Guvenir, West Linn High School

Menopause Affects Brain Proteins (Sex Differences in Lysosomal Proteins in the Dorsal Hippocampus)

Physics and Astronomy

First Place

Annika Martin, Wilsonville High School

WaveWise: Machine Learning Analysis of Neutron Star Merger Gravitational Wave Signals to Refine Equation of State Parameters

Second Place

Haruka Sakiyama, Nicole Beltman, West Linn High School

Pickle Ball and Noise

Third Place

Lily Vu, Yubin Kim, Wilsonville High School

Making Astronomy Accessible and Affordable - Lightweight and Inexpensive 3D-Printed 114mm "Hadley" Astronomical Newtonian Reflector Telescope

Honorable Mention

Hadley Nibert, Wilsonville High School

Project Pendulum

Advancing to the Northwest Science Expo

The state-level science fair, the Northwest Science Expo will take place at Portland State University on April 5th, 2024.

Annamika Konkola	Chase Crouch	Vanessa Partida
Grace Boyer	Alex Duval	Samuel Koehler
Lily Walsh	Chiara Arendt	Sarah Sanborn
Noah Donegan	Aasha Patel	Colin Bowyer
Kaleb Grunwald	Liam Ottum	Paige Jackson
Suhaani Garg	Suhaan Shettigar	Ava Brill
Kate Kurata	Addison Arakelian	Delilah Leusch
Grayson Zhang	Rowan Sechrist	Maryam Al-medyadi
Sabrina Zhang	Jacob Kemp	Jack Benninger
Claire Sousley	Sydney Taylor	Isabella Buzzelli
Sai Kalavai	Rubi Martin	Ashton Guvenir
Aarush Palve	Lucas Sobotta	Annika Martin
Madeline Santoso	Francisca Brevis	Haruka Sakiyama
Kaya Hald	Megan Whitt	Nicole Beltman
Anshu Mukherjee	Niyati Bhaskar	Lily Vu, Yubin Kim
Paul Liu, Sujun Shadrak	Zachary Santoso	Hadley Nibert
Kevin Lin	Kiera Taylor	
Arush Goswami	Abbie Jalili	

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 12, 2024 - Fri, May 17, 2024 in Los Angeles

Aasha Patel, Wilsonville High School

Sustainable Spirulina: Lysed Arthrospira platensis Phycocyanin-rich Biofertilizer (APB) for DWC Hydroponic Applications

Sydney Taylor, West Linn High School

"Reef Safe" Sunscreen - The Impact of Zinc Oxide Particle Size on Chlorophyll A and B Zooxanthellae

Megan Whitt, Wilsonville High School

Bioinspired Materials to Reduce Infective Endocarditis in Artificial Heart Valves

Suhaani Garg, West Linn High School

TNBCnano: Novel LBL Nanoparticles for Systemic Combination Delivery of siRNA and Doxorubicin as a Triple-Negative Breast Cancer Treatment